

# NREL's Renewable Energy Project Finance Tracking Initiative (REFTI)

**Q3 2009  
Summary**

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**February 5th, 2010**



# Housekeeping

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- Got audio?
  - Call in #: 888-889-6351
  - participant pass code: 4045691
  - 300 phone lines have been reserved – it is possible we could run out.

- Presentation and webinar recording will be made available in a few days at:

<http://www.nrel.gov/analysis/seminar/archive.html>

- Submit questions via internet conference – we will take at end of presentation

# Agenda

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- Intro to REFTI project
- Questionnaire Results
  - Will generally follow REFTI questionnaire design
- Interactive Polling
- Q&A
  - Written questions only

# Initial Thanks

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- Project sponsor – Office of Strategic Planning and Analysis (SPA) of the DOE
- To all individuals who participated in the Q3 2009 REFTI questionnaire
- To everyone who is participating today
- Colleagues that helped pull this together

# REFTI: Background

- Originally designed to obtain quality input data for NREL-developed models (SAM, ReEDS)
  - “What is appropriate discount rate?”
  - “What debt / equity ratio should I assume?”
- Great opportunity to develop a dialogue with RE development and finance community
  - Deal structures
  - Lessons learned in getting RE projects to fruition
  - Informing policymakers – are programs working and why?
- Several months of scope, questionnaire development & testing
- Launched the questionnaire mid-December
  - For projects with financial closing in Q3, 2009

# REFTI: Hoping to Accomplish – near term

- Outreach on project:
  - Develop a database of RE developers, financiers, utilities, consultants, etc.
  - Represent breadth of RE development across U.S. regions
- Develop trust with RE community to provide NREL:
  - Confidential data
  - Insight into deal structures
  - Utilization of government incentives
- Report on relevant project finance data, trends
- Get feedback on program / questionnaire design

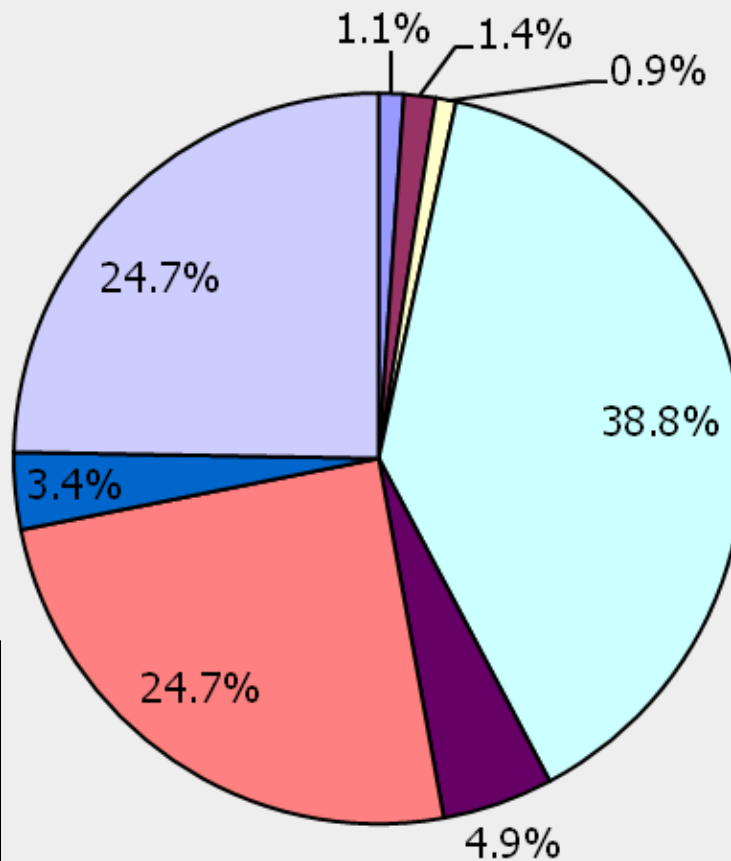
# Caveats

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- **This is a summary of data as reported by REFTI participants.**
- **Data provided was generally not validated by NREL, although certain screens were applied**
- **Potential concerns:**
  - Duplicate data
  - Definition of “financial closure”
  - Small sample size for certain questions
  - Confusion re: questionnaire design

# REFTI: 358 Participants

Please tell us about your firm. Are you primarily a....

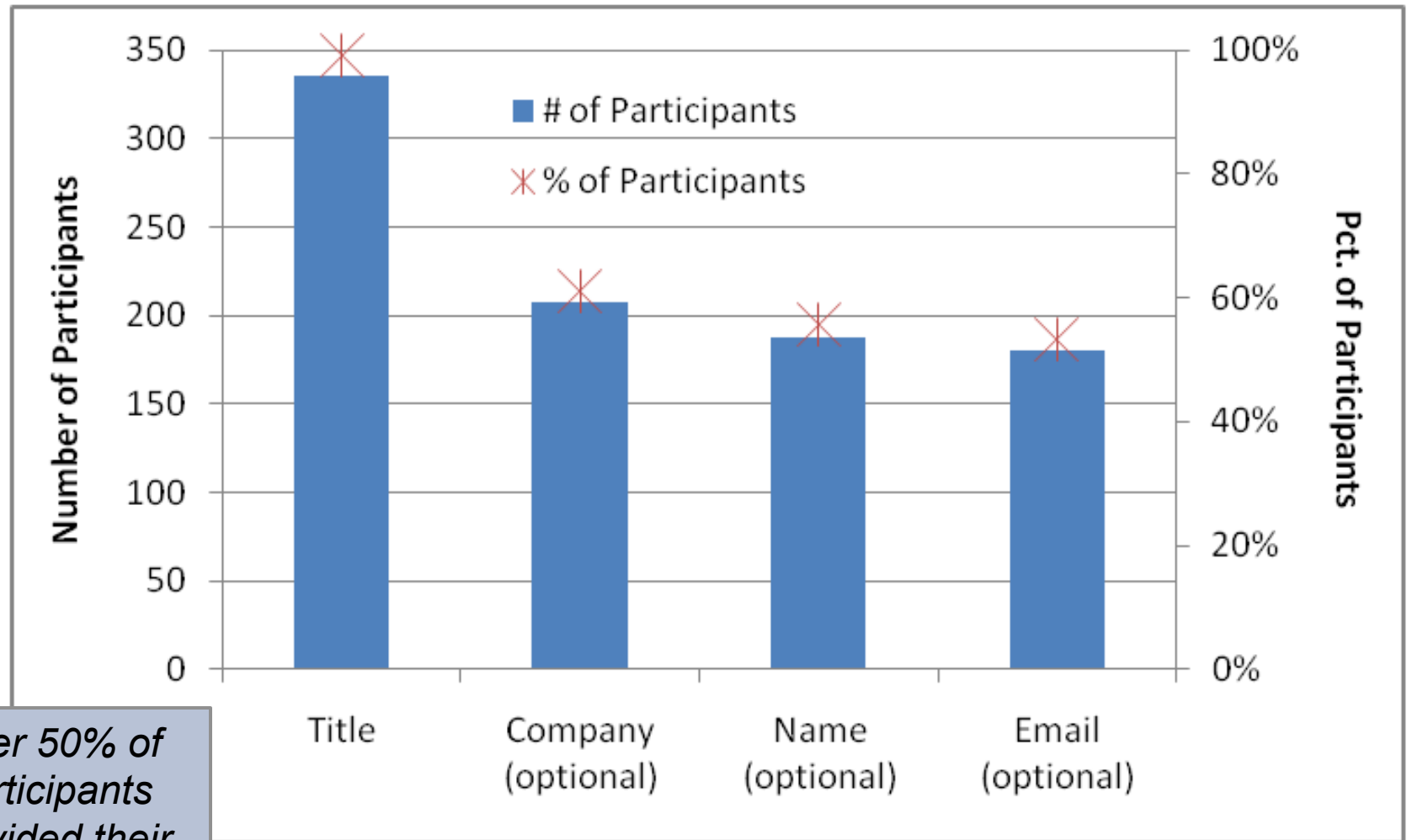


- Tax Credit Equity Financier
- Other Equity Financier
- Debt Financier
- Developer
- Utility
- Counsel / Consultant
- Energy Consumer
- Other

*Well represented by developers and counsel / consultants*



# Over Half of Participants Left Contact Information



*Over 50% of participants provided their email, name and Co. info*

# REFTI Question: Primary Info on Key Projects

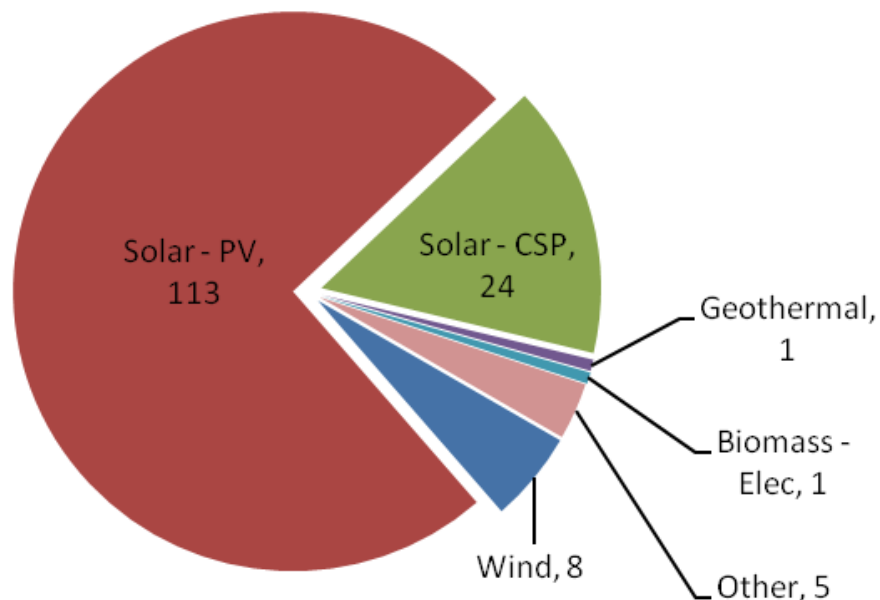
## 1. Please input the following project data...

	Technology Type	Nameplate Capacity (MW)	Region
Project 1	<input type="text"/>	<input type="text"/>	<input type="text"/>
Project 2	<input type="text"/>	<input type="text"/>	<input type="text"/>
Project 3	<input type="text"/>	<input type="text"/>	<input type="text"/>
Project 4	<input type="text"/>	<input type="text"/>	<input type="text"/>
Project 5	<input type="text"/>	<input type="text"/>	<input type="text"/>

Comments

Power Sold To	Total Project Cost (\$millions)	Your Direct Investment (\$millions)
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>

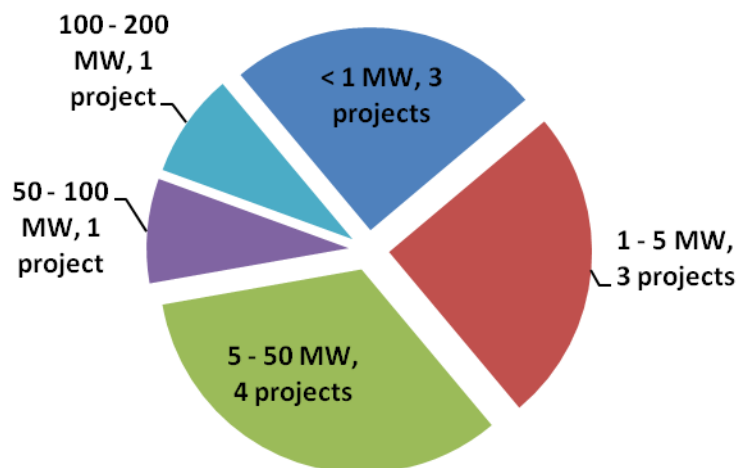
# Technologies Reported In REFTI (152 projects)



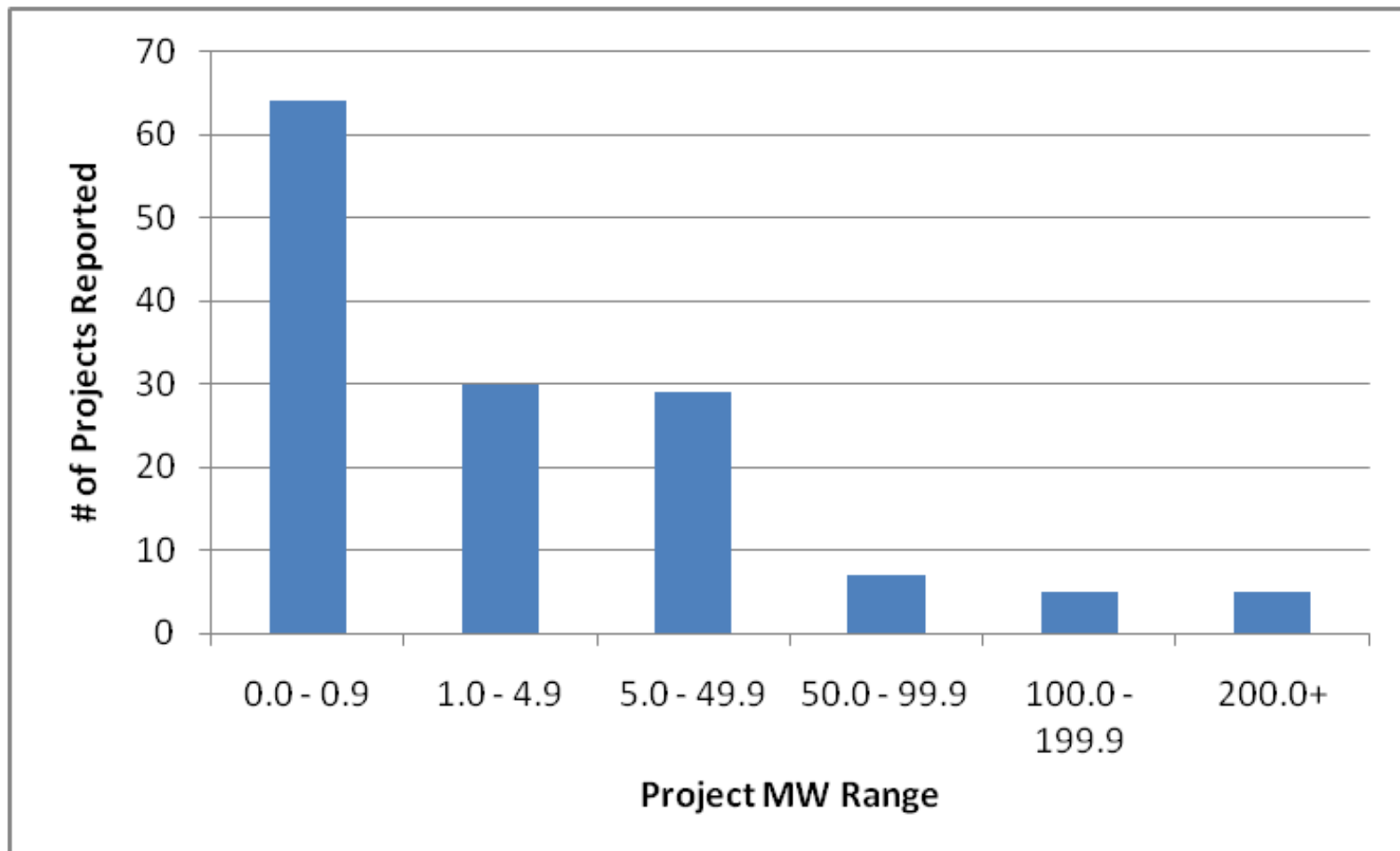
*Solar dominates Q3 closings. Plethora of CSP projects reported*

*But REFTI allows multiple entities in deal to provide data. We believe 12 unique CSP projects were financed in Q3, most under 5 MW*

## 12 CSP Projects After Screen

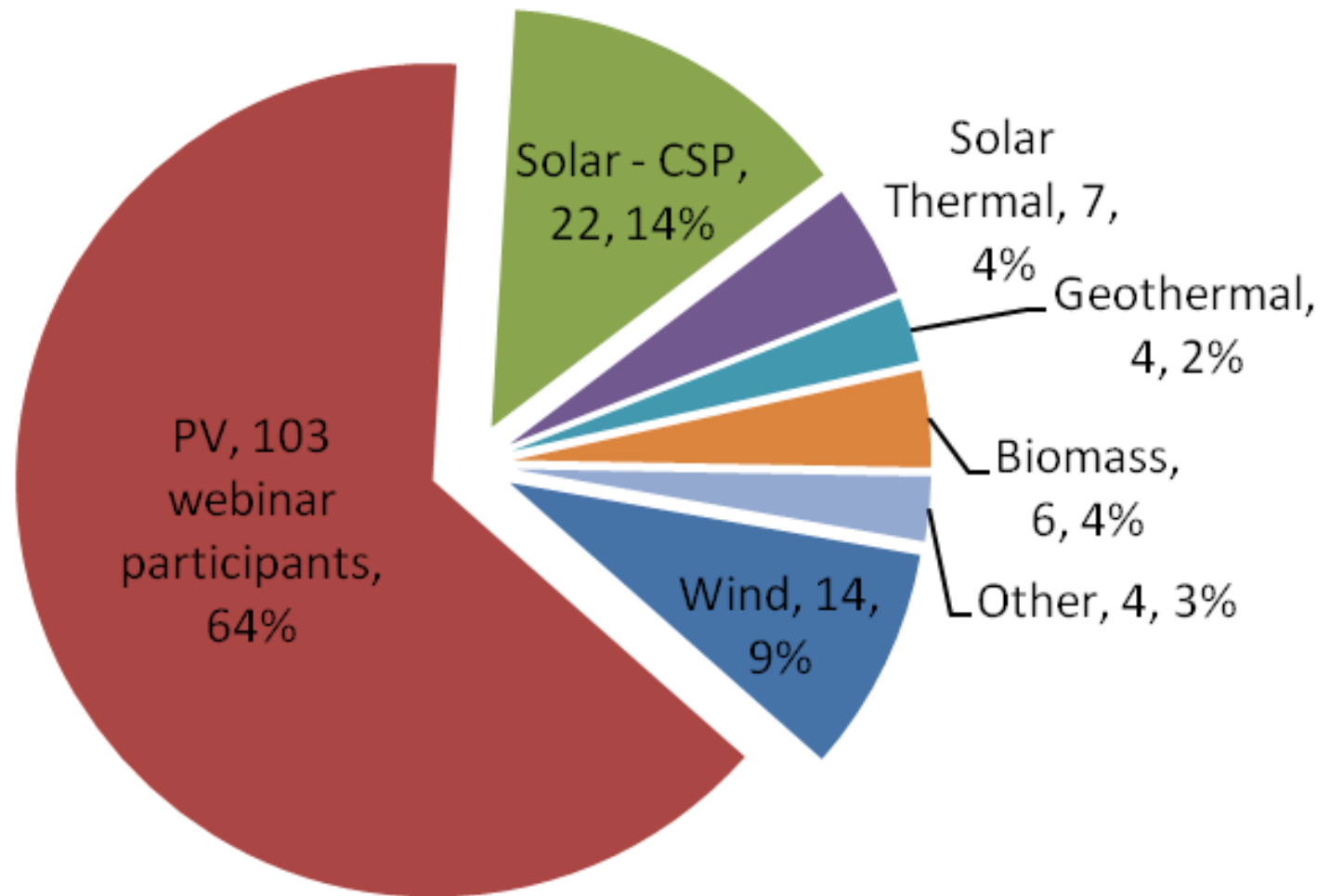


# Wide Range of Projects Reported On



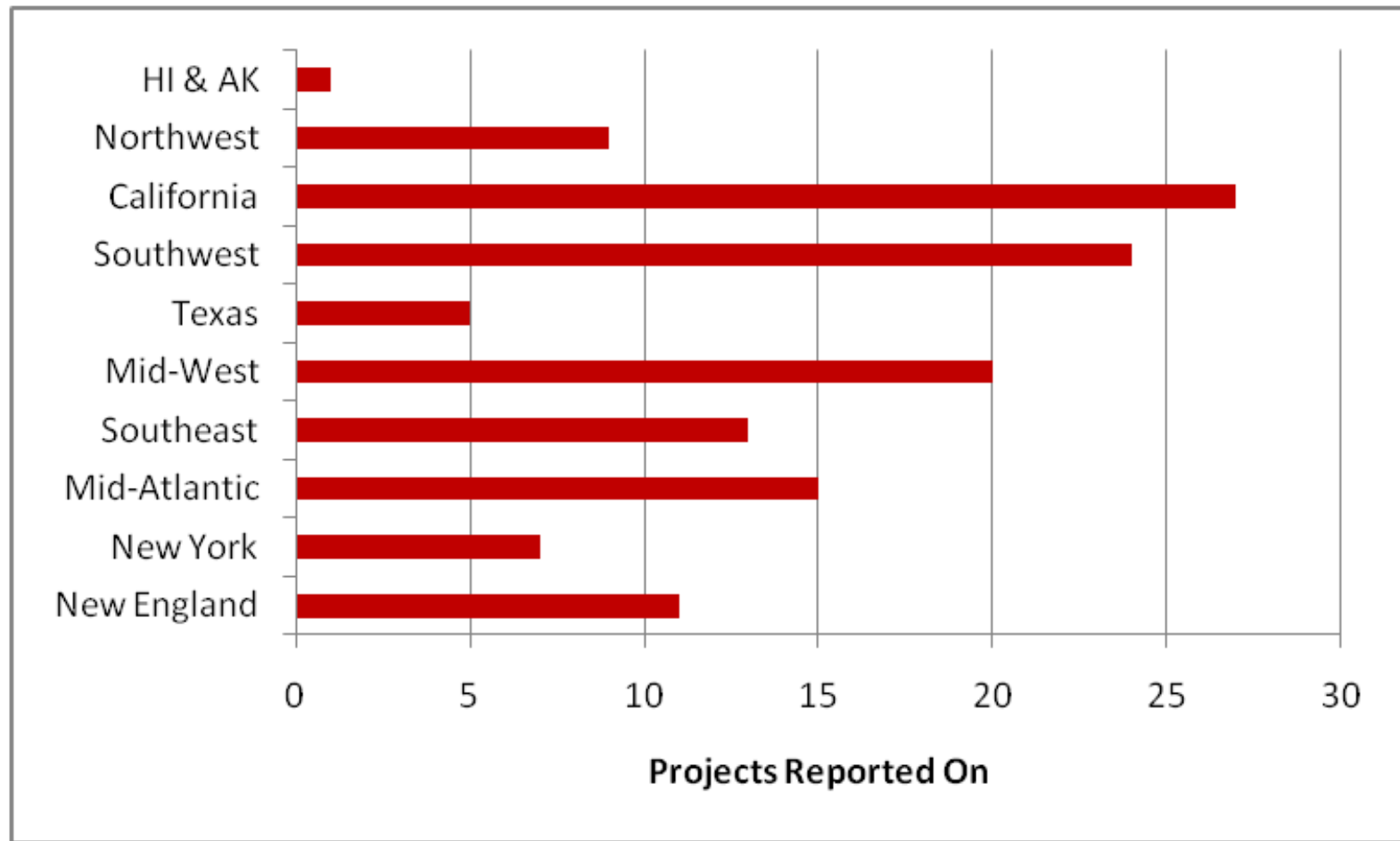
*140 projects reported directly for this question. 17 projects 50 MW and larger reported by REFTI participants*

# Webinar Poll #1: What technology do you primarily develop, finance, consult to, etc.?



# Geographic Dispersal of Projects

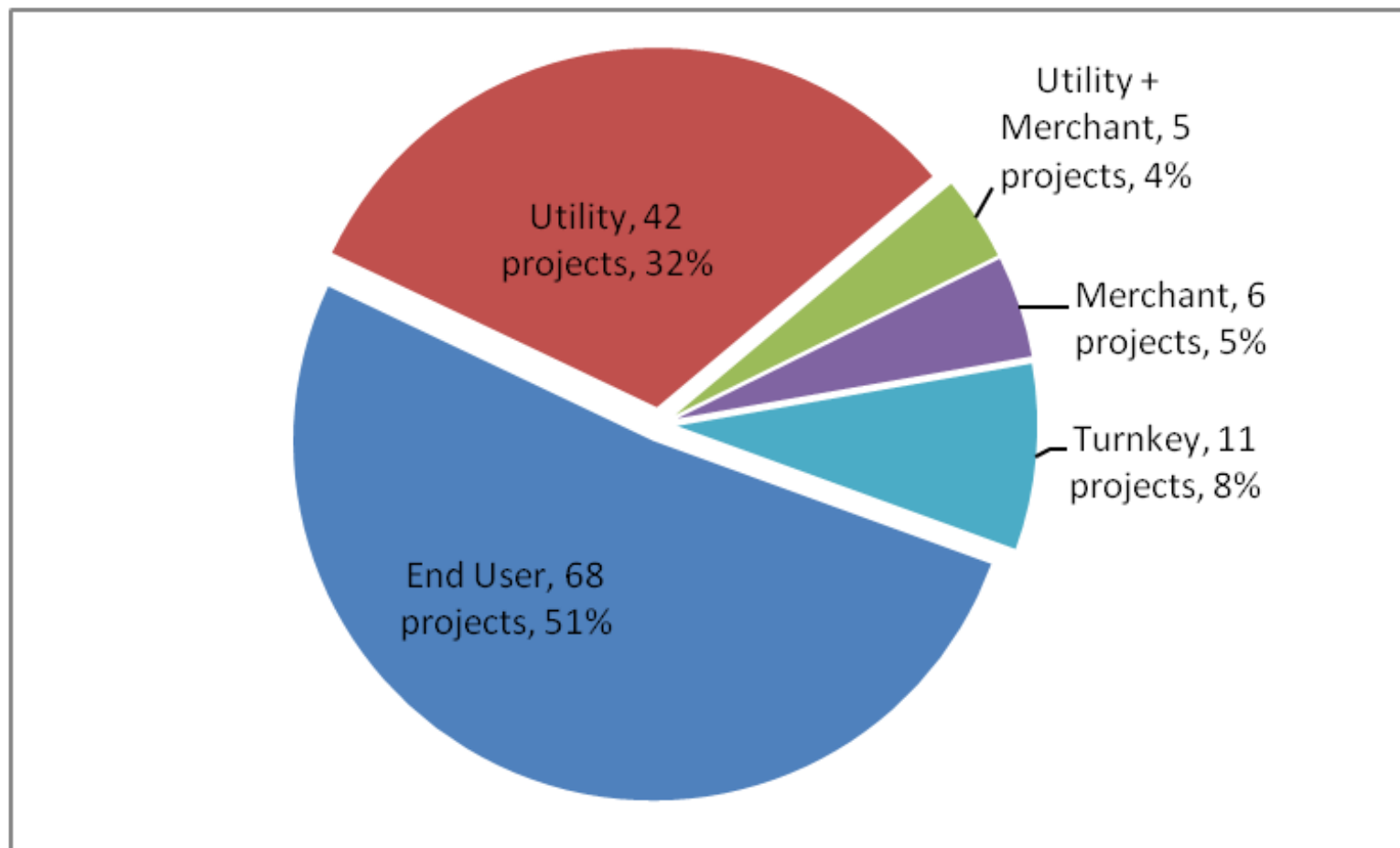
*(# of projects by region)*



*132 projects reported for this question. California and Southwest have largest share, but all U.S. regions represented in REFTI survey*

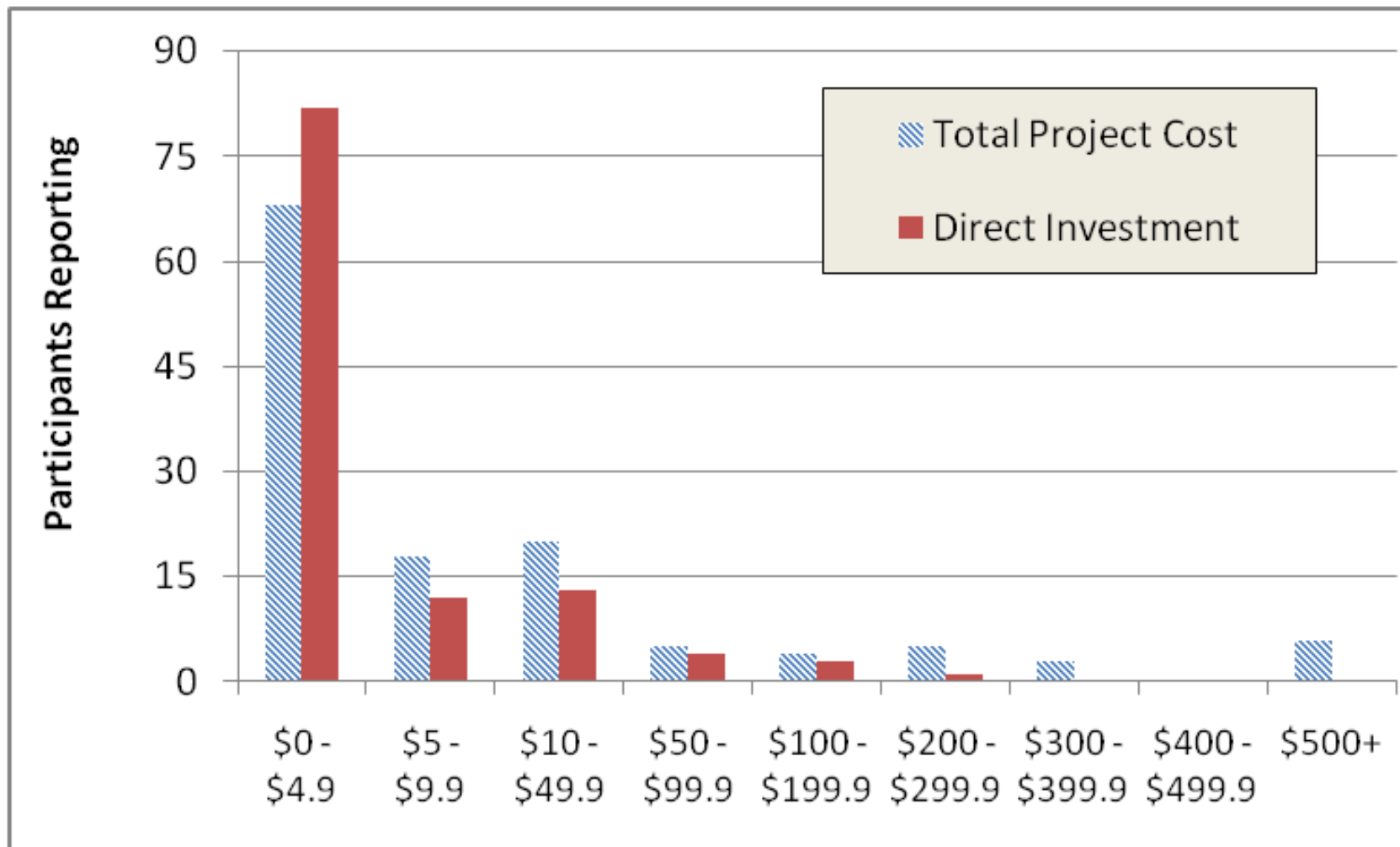
# Power Sold To...

*(# of projects, % projects reporting)*



*Majority of projects sold energy to end user (host). 9% of project indicated partially or full merchant sale of energy. 132 projects reported in this question*

# Total Project Cost & Direct Investment



*129 & 115 REFTI participants responding, respectively*



# REFTI Question: For All Deals Behind-the-Meter

2. For your projects that are on-site and behind-the-meter, please input the following...

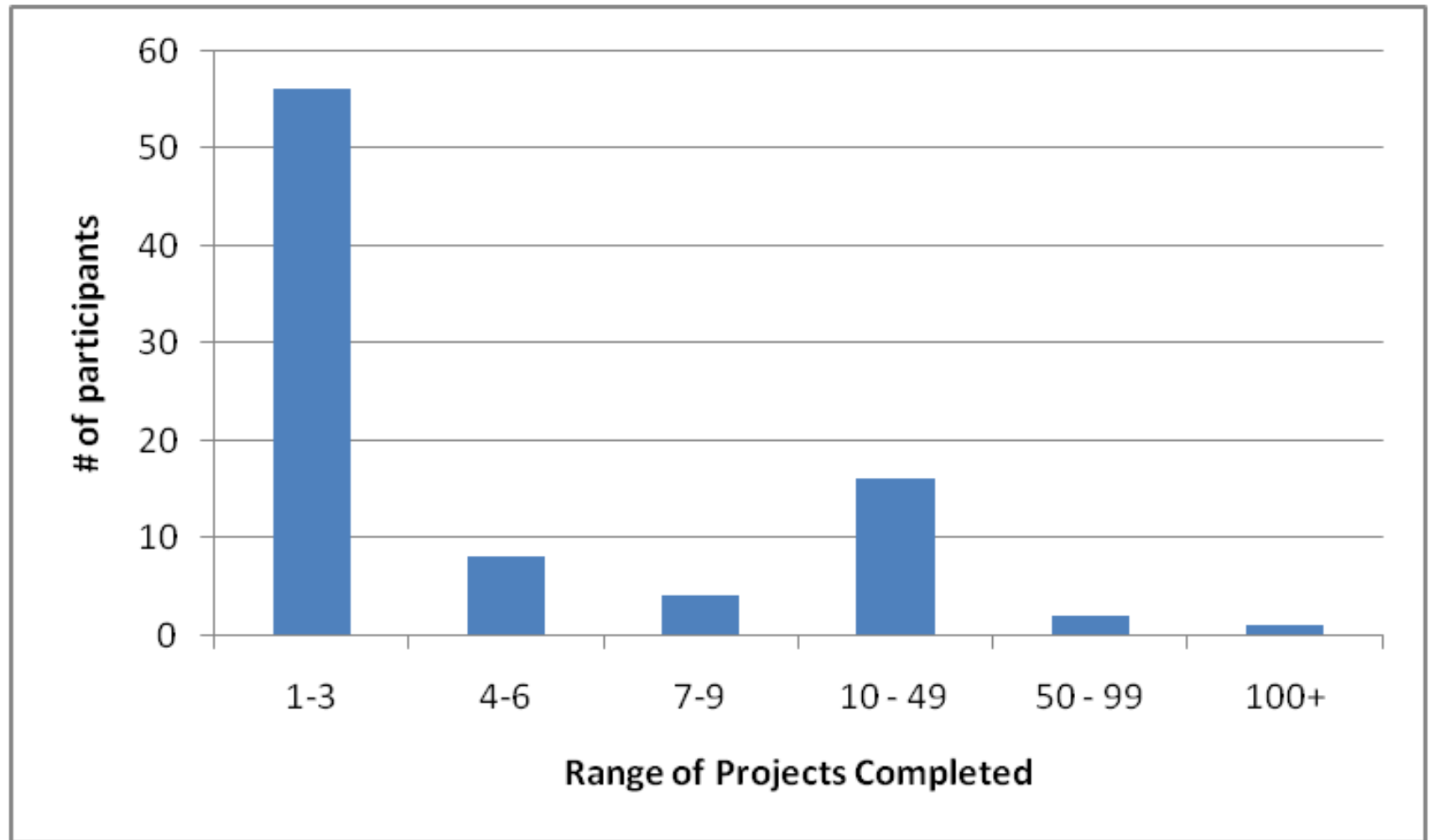
	Number of Deals	Nameplate Capacity (aggregate MW)	Typical Customer Financing Structure
Residential	<input type="text"/>	<input type="text"/>	<input type="text"/>
Commercial & Industrial	<input type="text"/>	<input type="text"/>	<input type="text"/>
Federal Government	<input type="text"/>	<input type="text"/>	<input type="text"/>
State & Local Govt.	<input type="text"/>	<input type="text"/>	<input type="text"/>

Comments

Avg. Customer Payback (yrs)	Avg. Customer Discount Rate (%)
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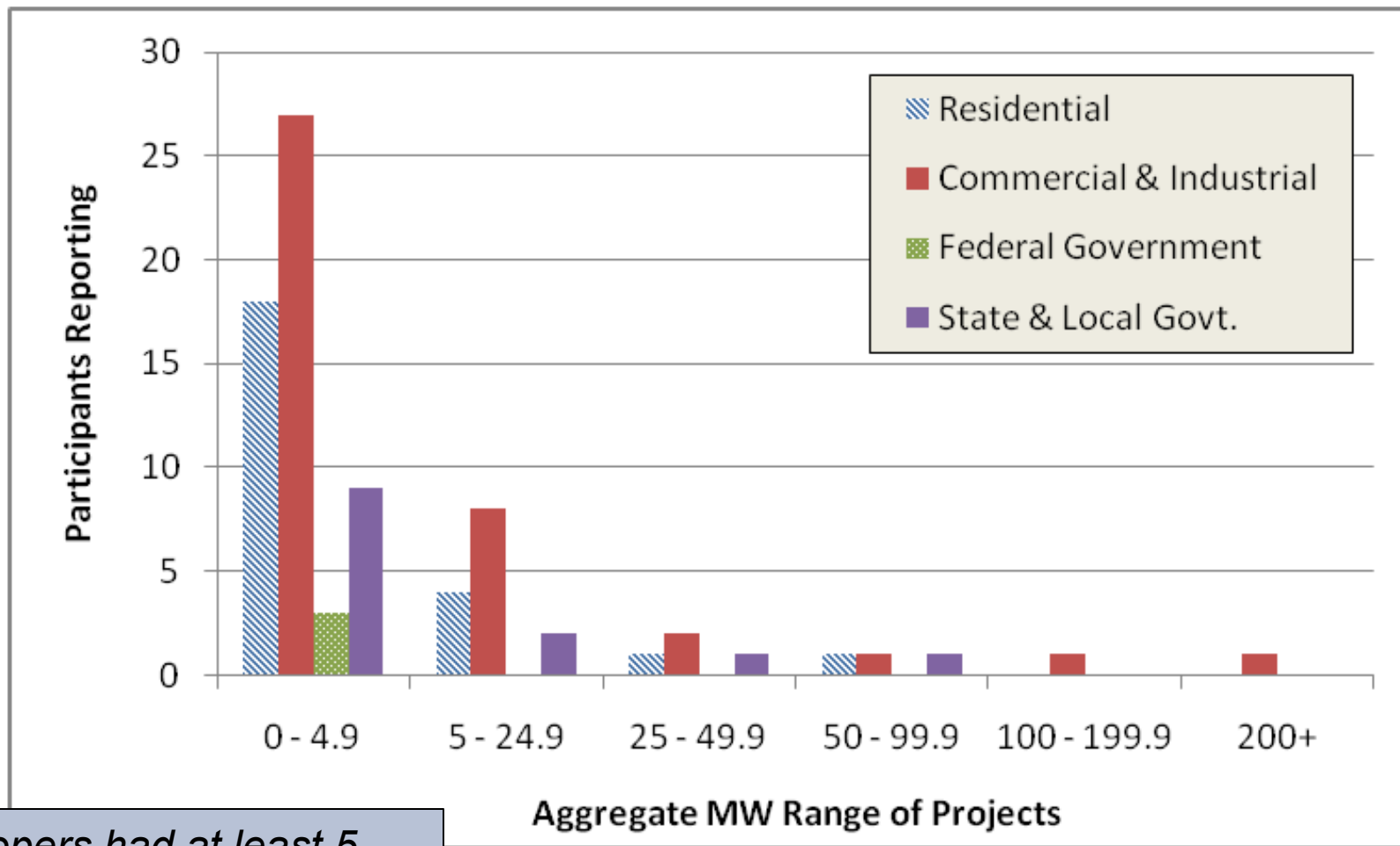
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

# Multiple Behind-the-Meter Projects Completed



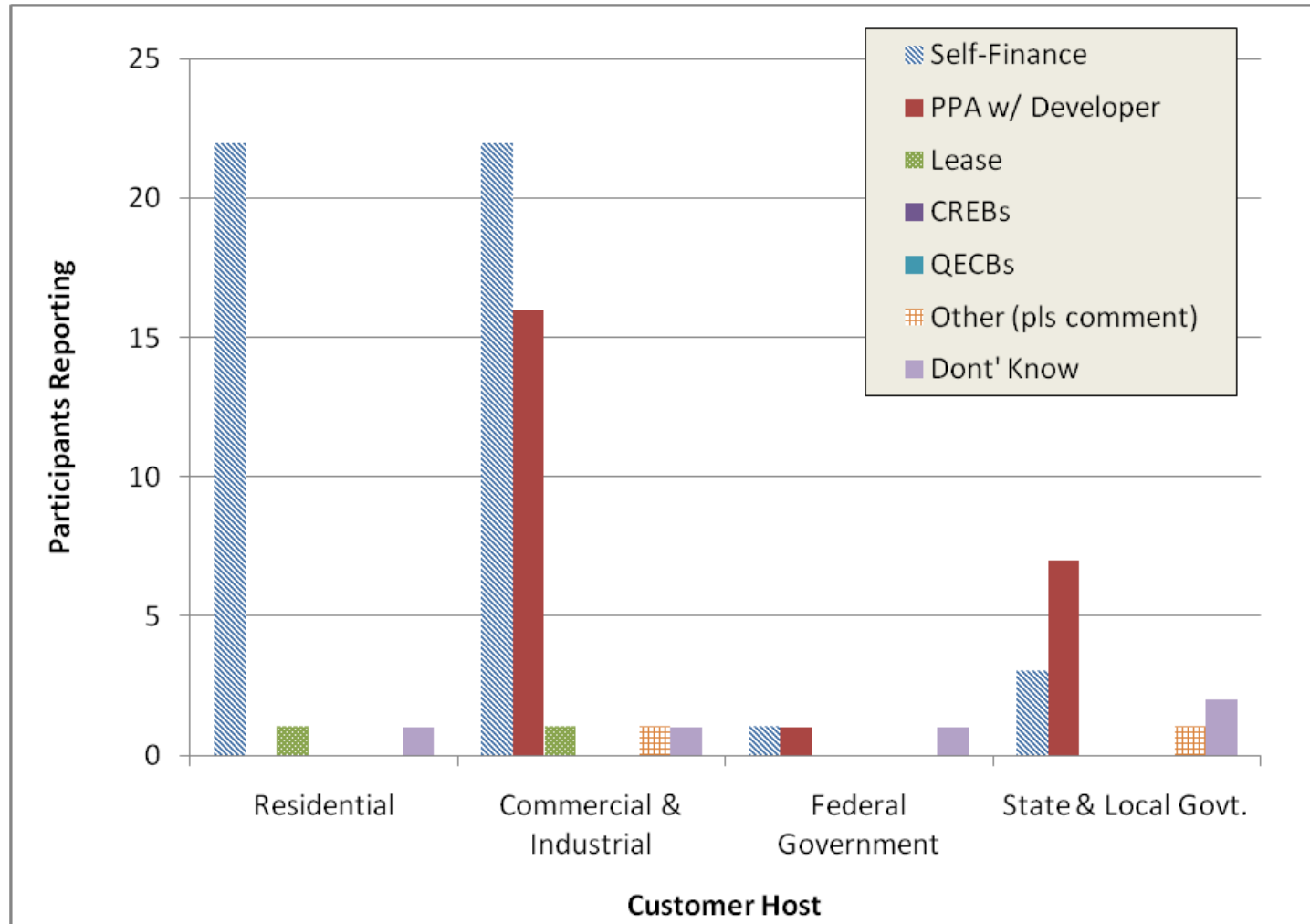
*19 participants reported 10 or more projects  
(but not all weighed in detailed financials)*

# Aggregate MW Installed at End-User Locations



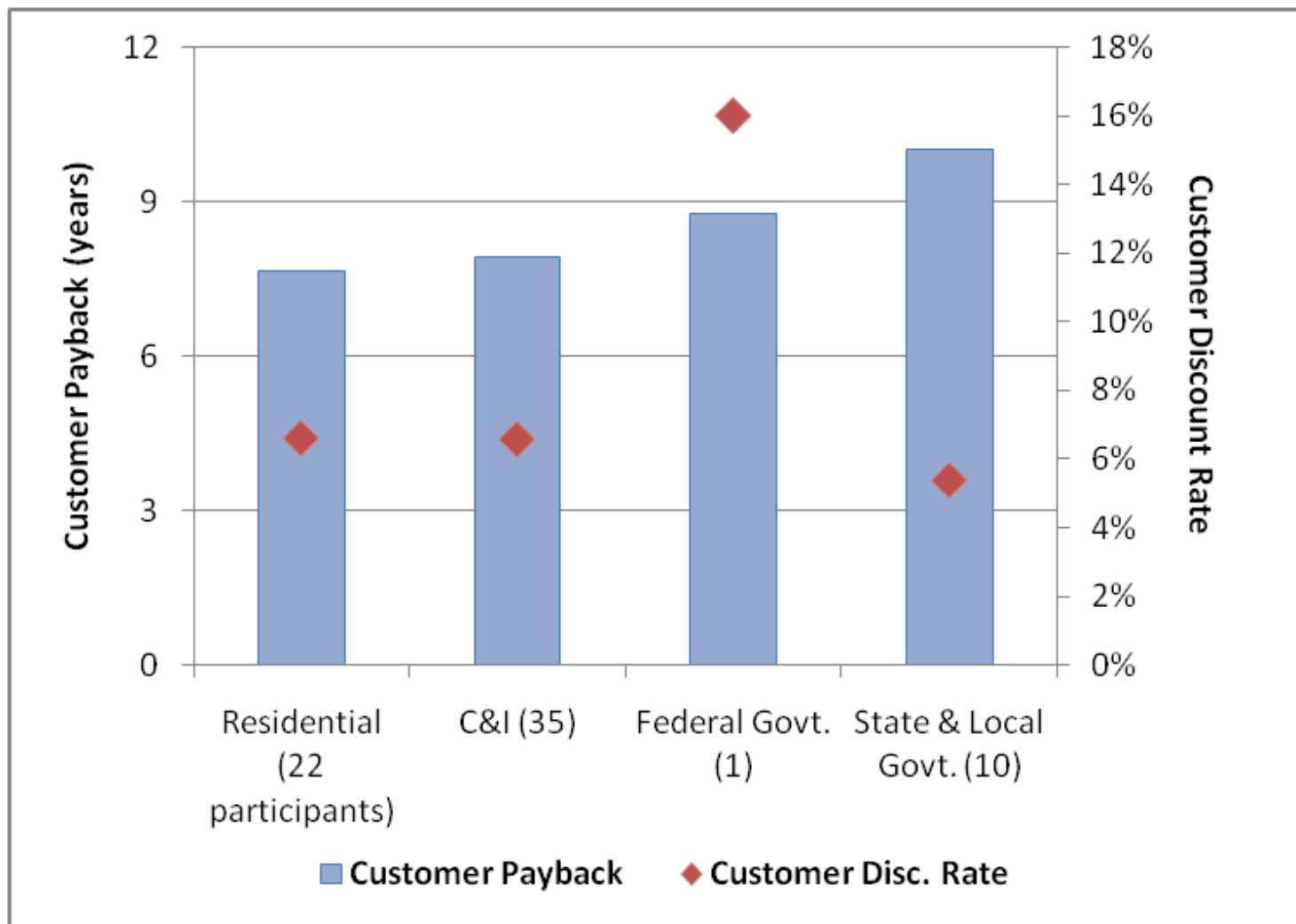
*13 developers had at least 5 MW of projects with C&I end-use customers. Total of 80 participants reporting.*

# Customer Finance by Customer Type



*Customers primarily self-financing or using PPAs. Federal programs (CREBs, QECBs) not widely reported. 81 participants reporting*

# Average Customer Payback & Disc. Rate



*Res. / C&I projects have shortest net paybacks (i.e., after incentives), based on wtd. averages reported. 66-73 participants reporting*

# REFTI Question: Primary Finance Data

*Seeking financial structure, source of debt  
finance, depreciation and incentives applied*

## 3. Financial Information

For all projects which closed financing in the 3rd quarter, 2009.

All questions should be answered from the perspective of the project, not the customer or site host

Add Question Here

Edit Question Move Copy Delete

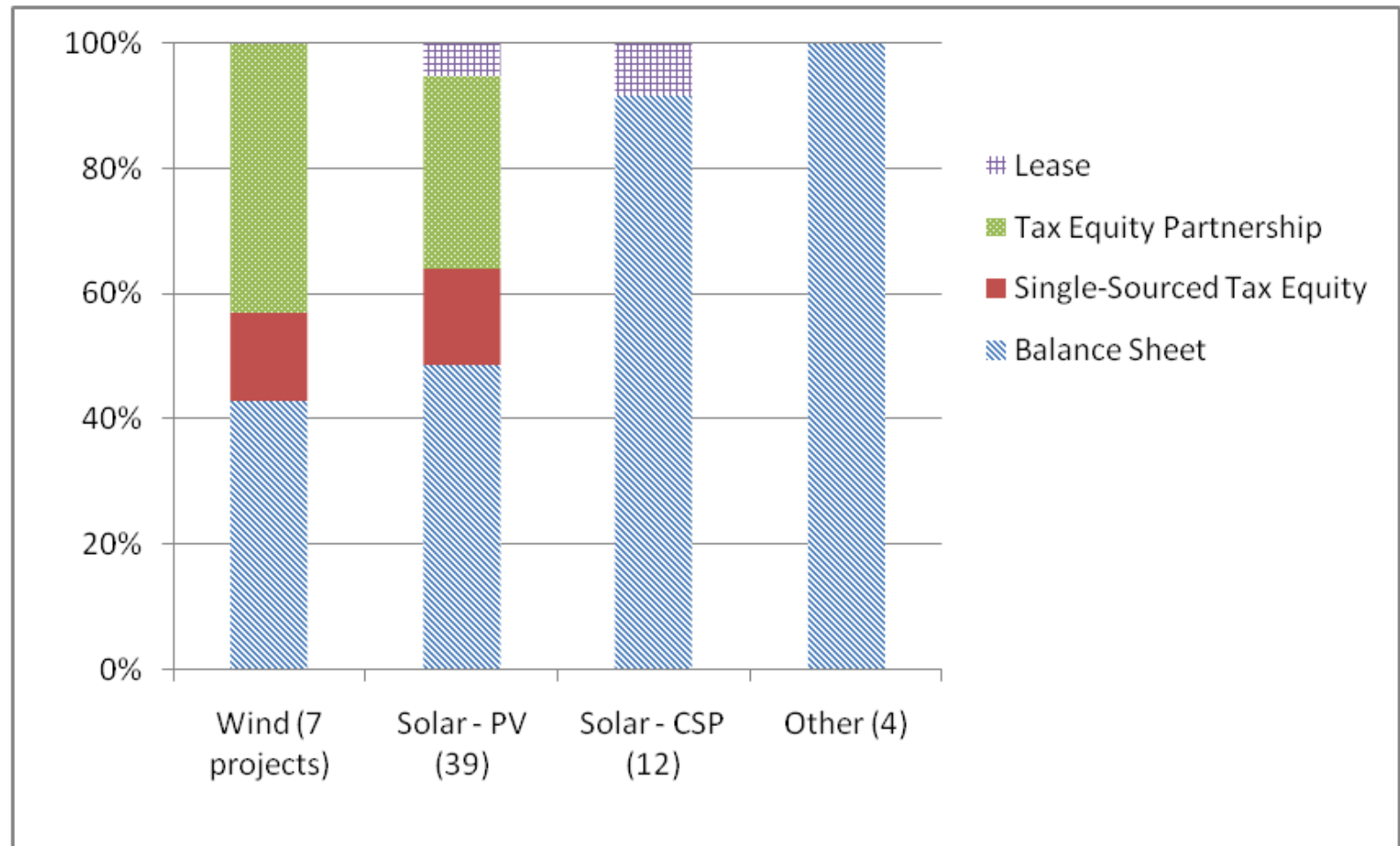
### 1. Select the primary FINANCIAL STRUCTURE characteristics of your projects.

	Financial Structure	Debt Finance	Depreciation	Federal Incentive	State Incentive
Wind	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Solar - PV	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Solar - CSP	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Geothermal	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Biomass - Elec	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Biomass - Non-Elec	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Other (pls comment)	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Comments

# Project Financial Structure

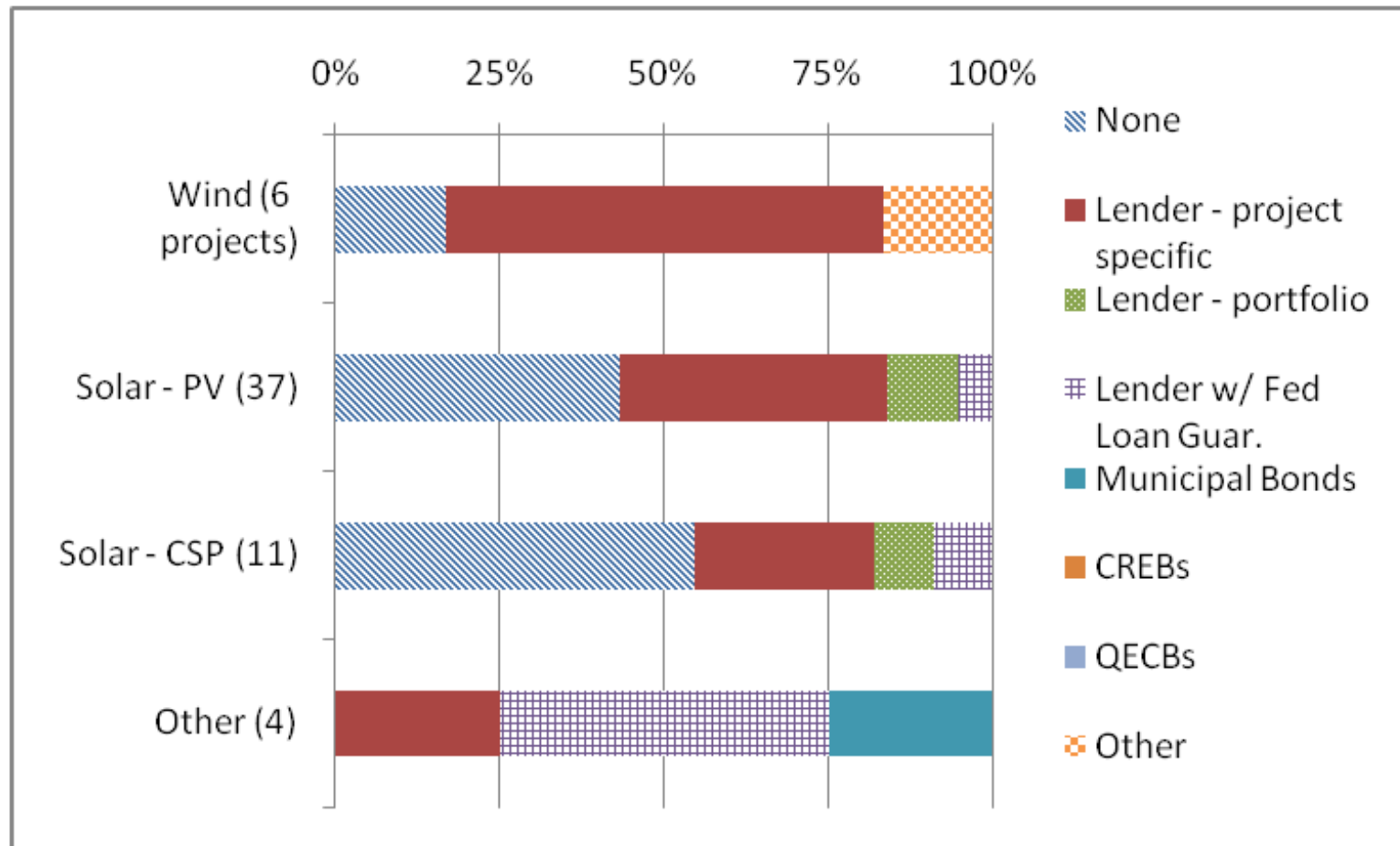
*(% of projects by financial structure)*



*Tax equity only available for wind and PV. Other sources relying (almost) exclusively on balance sheet finance. 61 projects reported*

# Debt Source by Technology

(% of debt source, # of projects reporting)

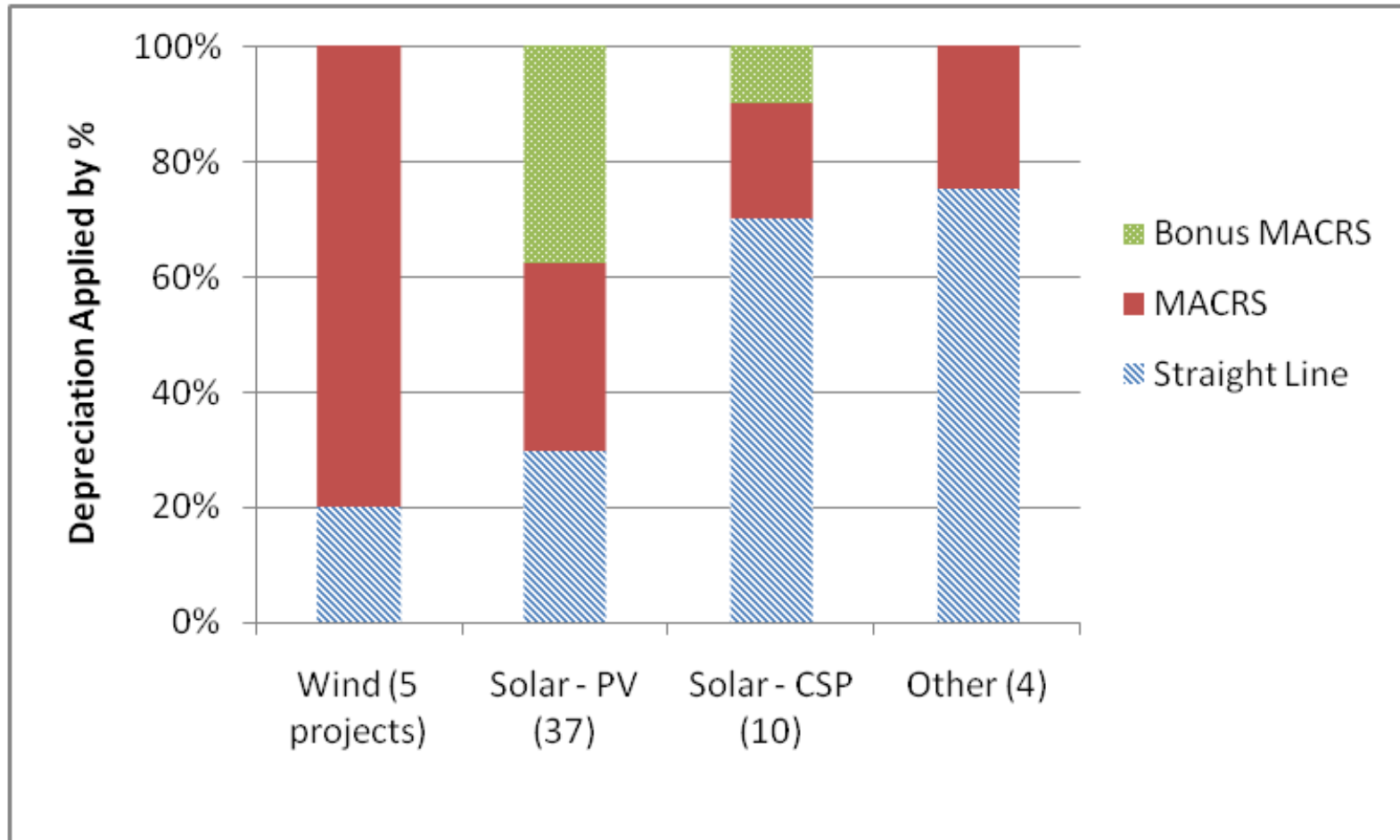


*Non-electric biomass getting debt support from Federal & municipal debt sources.  
58 projects reporting*



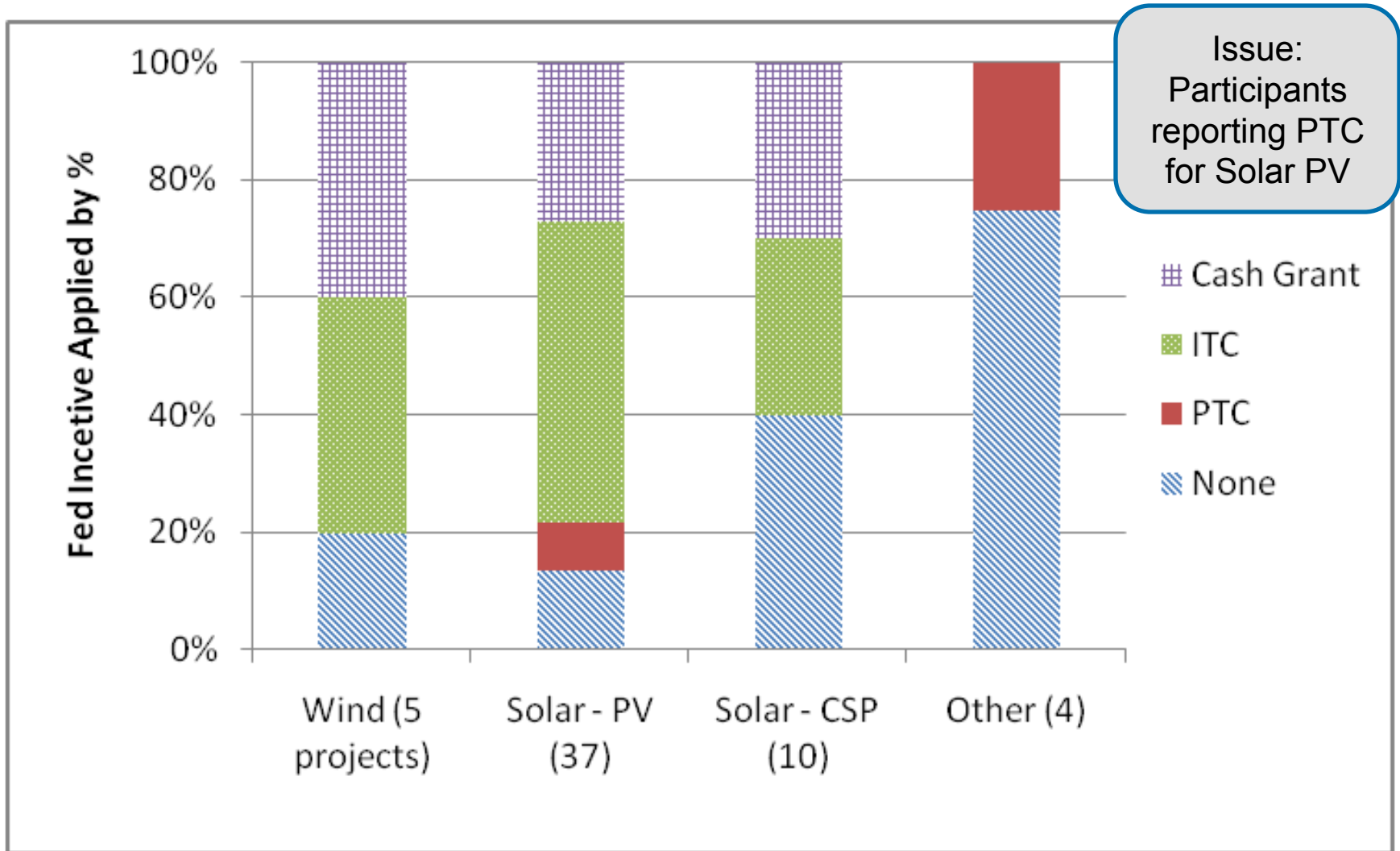
# Depreciation Applied

*(by % of projects reporting)*



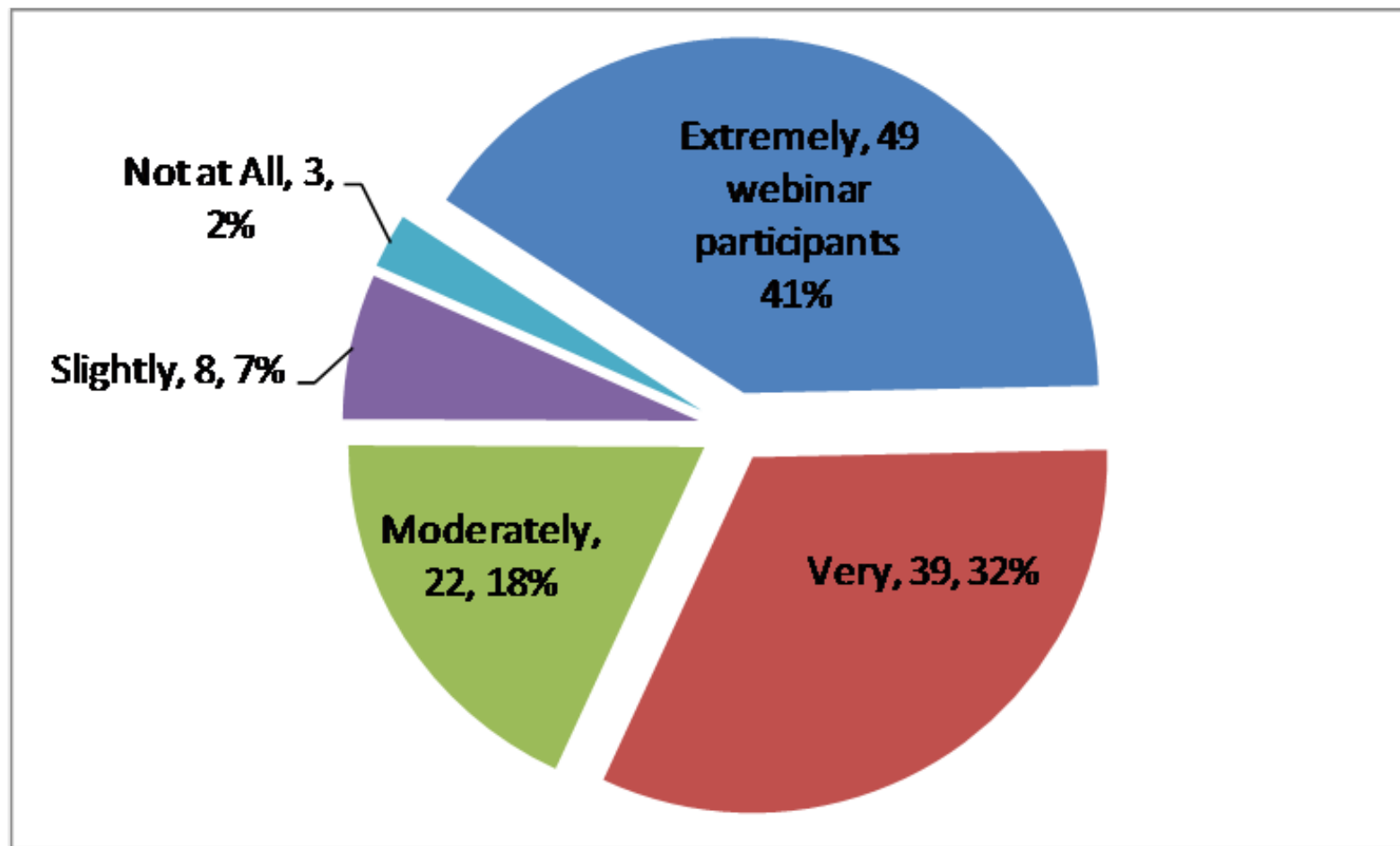
*Straight-line depreciation useful for certain projects – particularly CSP. 56 projects reporting*

# Federal Tax Incentive Taken



*Tax incentives not needed for all RE projects. 56 projects reporting*

## Webinar Poll #2: Importance of Treasury Grant Program to RE Project Development



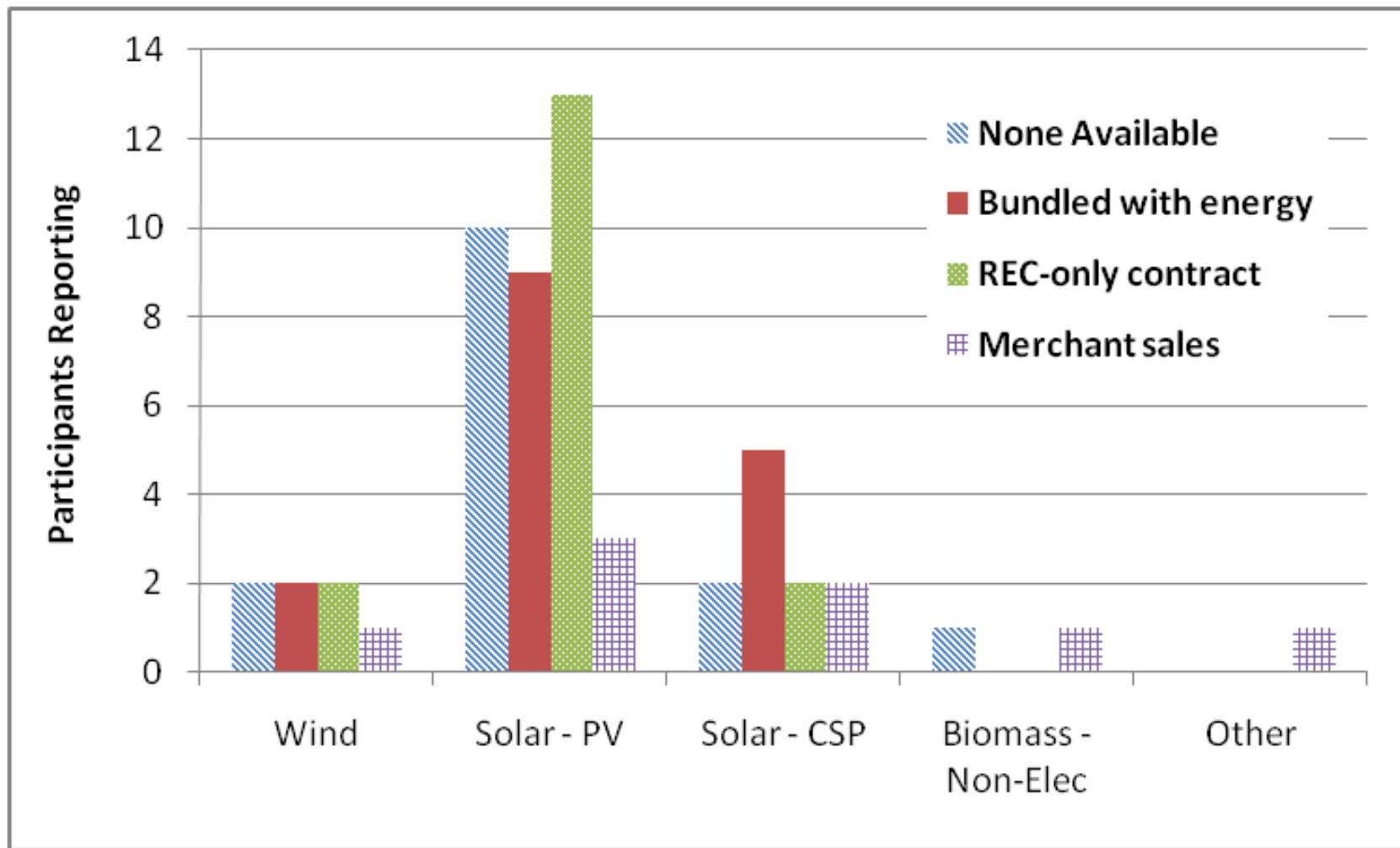
# REFTI Question: REC Sales

## 2. Provide the expected method of REC SALES and REC TYPE by technology...

	REC Sales	REC Type
Wind	<input type="text"/>	<input type="text"/>
Solar - PV	<input type="text"/>	<input type="text"/>
Solar - CSP	<input type="text"/>	<input type="text"/>
Geothermal	<input type="text"/>	<input type="text"/>
Biomass - Elec	<input type="text"/>	<input type="text"/>
Biomass - Non-Elec	<input type="text"/>	<input type="text"/>
Other (pls comment)	<input type="text"/>	<input type="text"/>

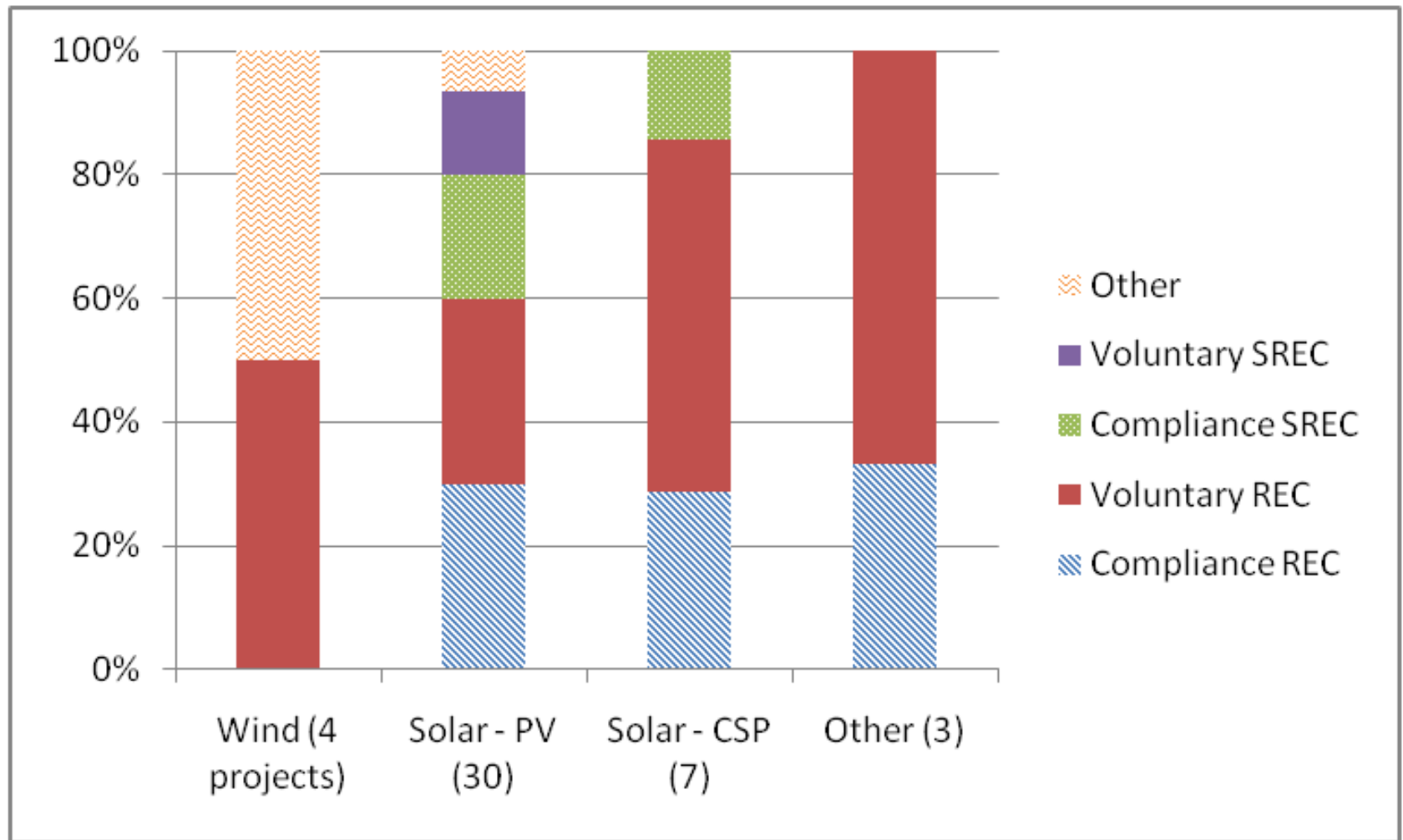
Comments

# How RECs Were Packaged



*RECs sold in variety of ways across all technologies. Merchant REC sales useful.  
53 participants reporting*

# REC Type by Technology



44 projects reported on

# REFTI Question: PPA Parameters

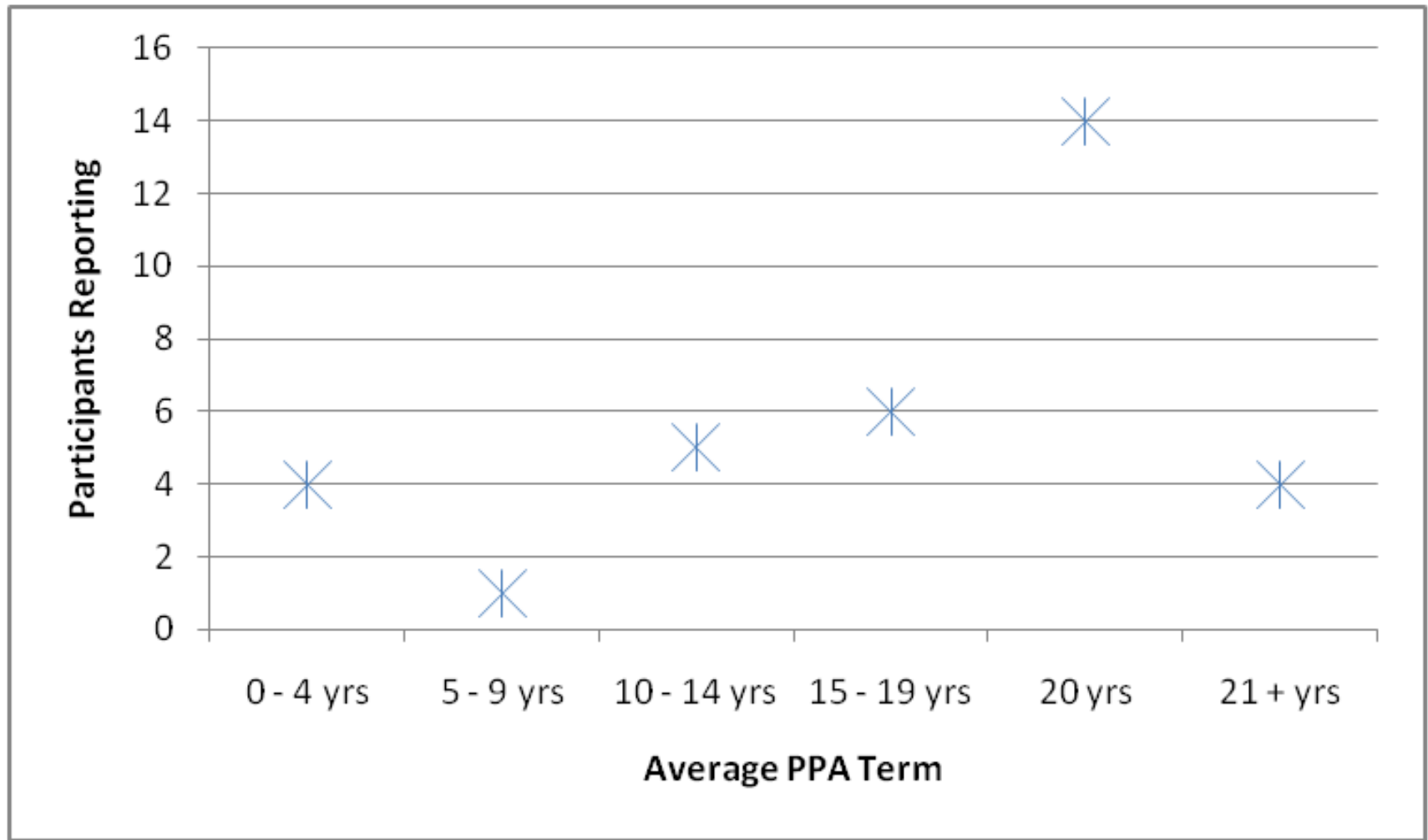
## 3. Please provide the following REVENUE PARAMETERS....

	PPA Term (yrs)	PPA Price in Yr 1
Average	<input type="text"/>	<input type="text"/>
Low	<input type="text"/>	<input type="text"/>
High	<input type="text"/>	<input type="text"/>

Comments

PPA Price Escalation (%)	Customer Buyout Option
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

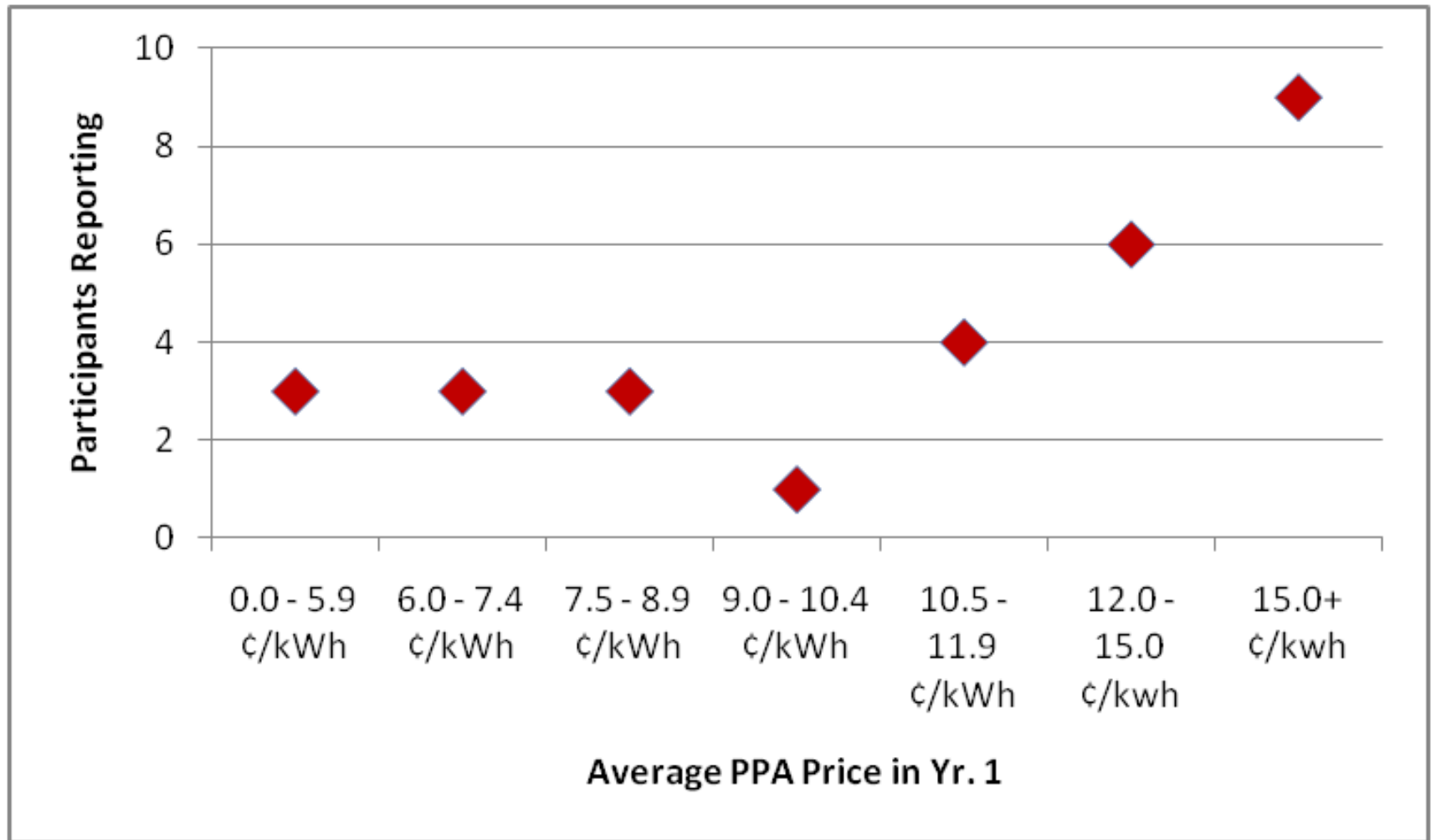
# PPA Duration



*PPAs most commonly set at 20 years, but wide dispersion to match deal specifics.  
34 participants reporting*

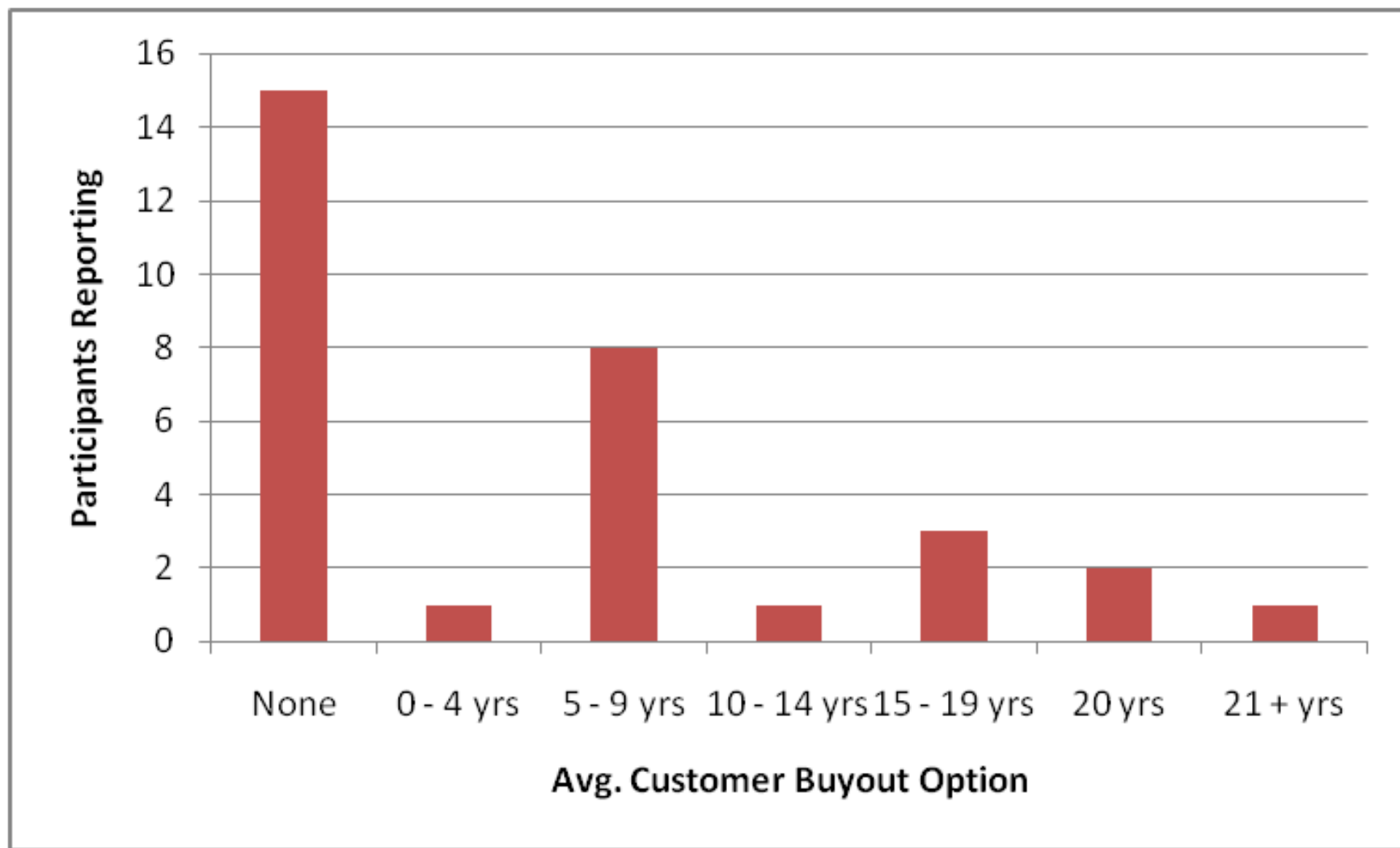


# PPA Starting Price



*Wide range of PPA starting prices reported. 29 participants reporting, resp.*

# Customer Buyout Option



*31 participants responding to question. 16 allow customer buyout option*

# REFTI Question: Equity Capital

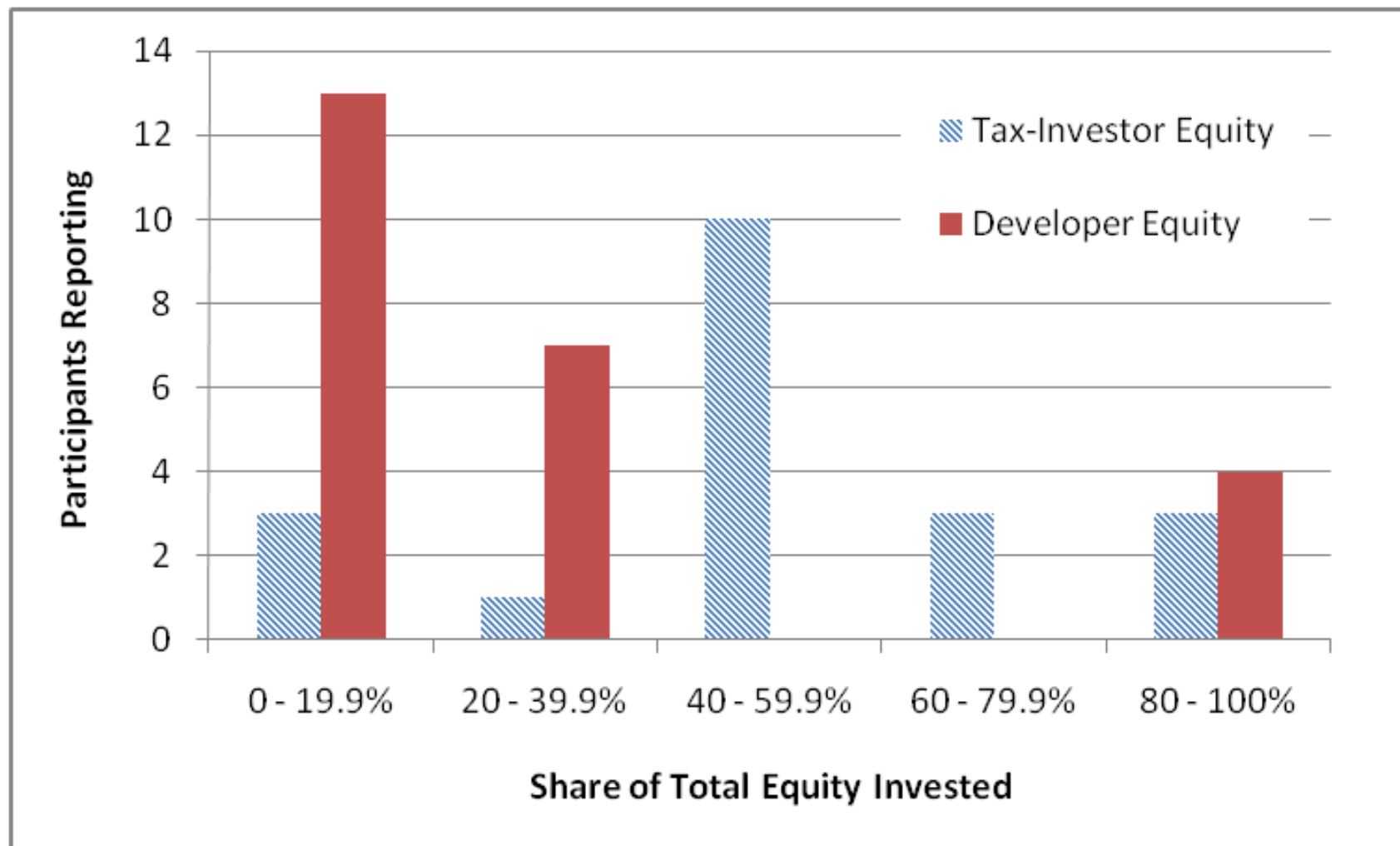
## *Seeking Ratio and Expected Return for Tax Investor and Developer*

### 4. Regarding project EQUITY CAPITAL (based on after-tax returns)...

	Tax-Investor Equity / Total Capital	Expected Return on Tax-Investor Equity	Developer Equity / Total Capital	Expected Return on Developer Equity
Average	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Low	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
High	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

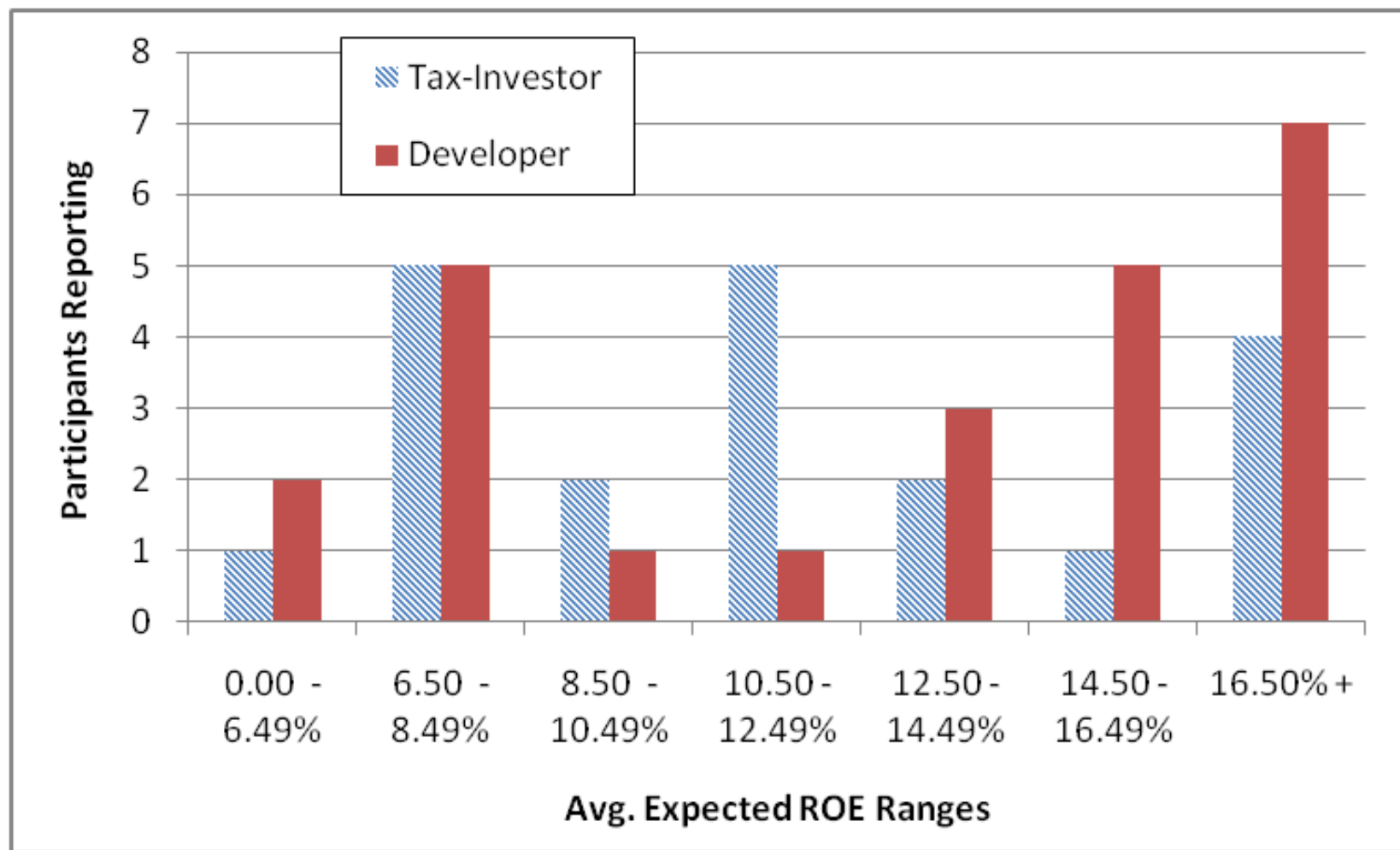
Comments

# Source of Equity



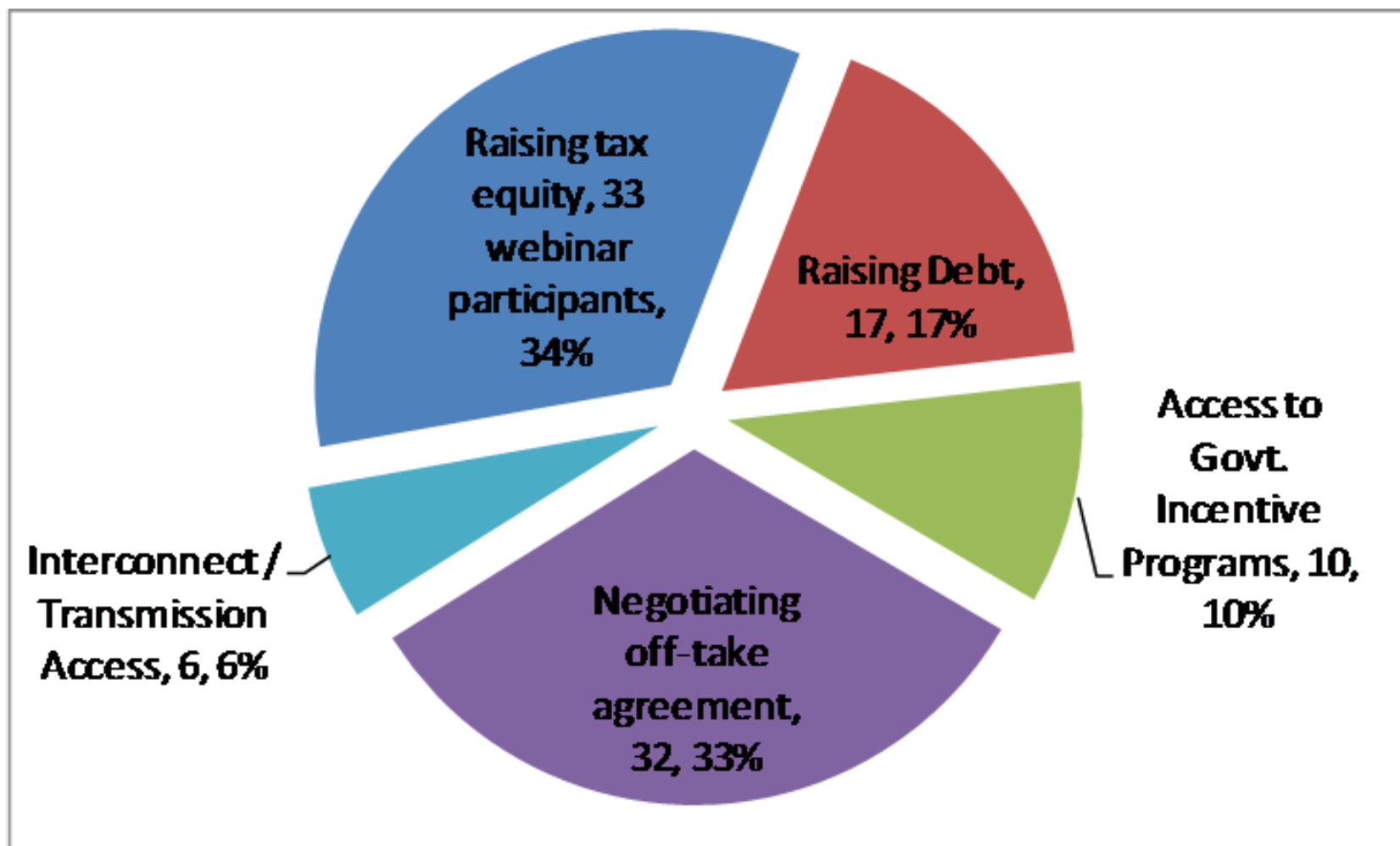
*REFTI participants represented both developer and tax-investor equity. 27 participants reporting*

# Expected ROE By Equity Source



*Wide range of expected RROE reported among tax investors and developers. 27 participants reporting*

## Webinar Poll #3: Primary Barrier to RE Project Development



# REFTI Question: Debt Ratio and Cost of Debt

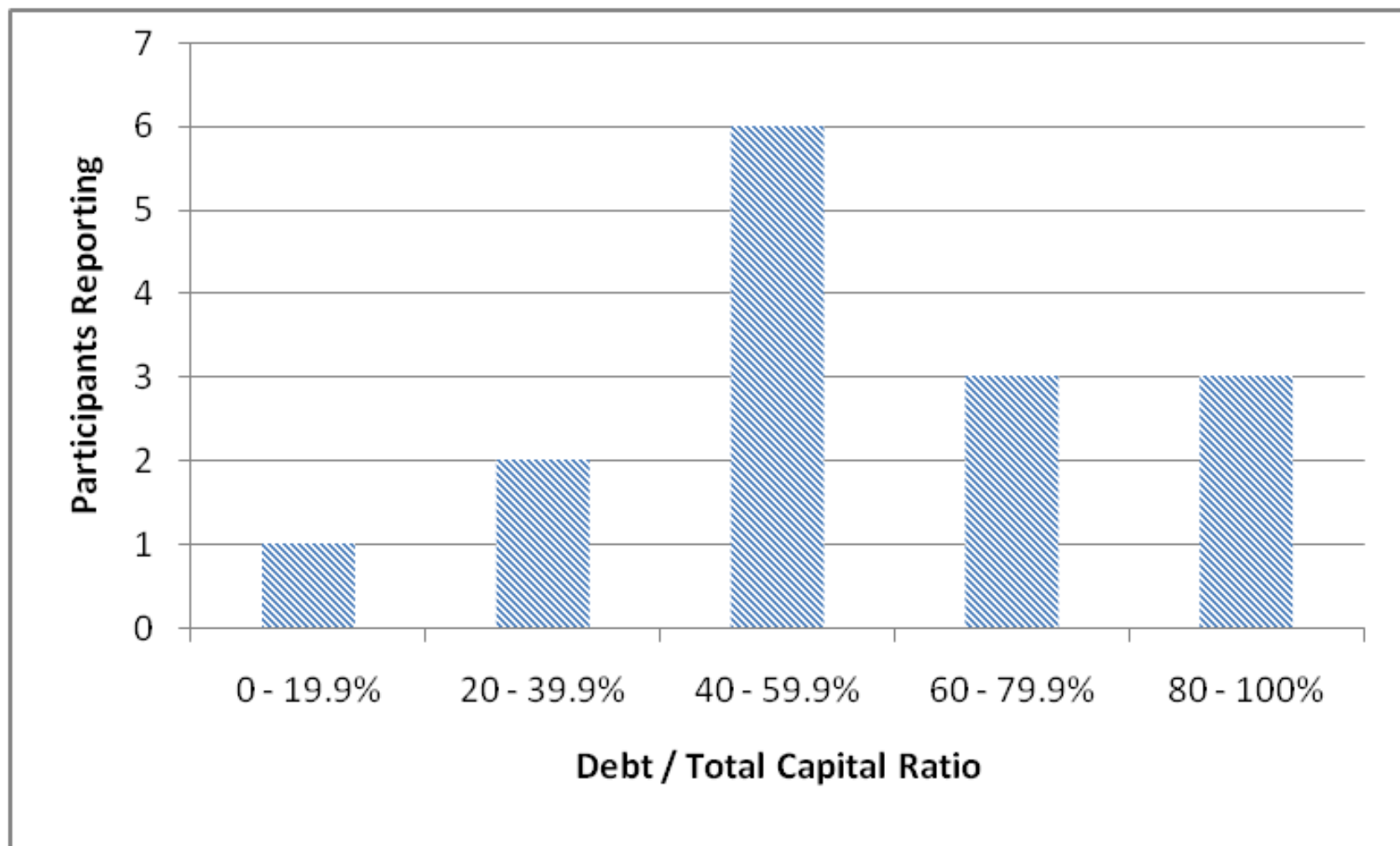
*Seeking various debt parameters*

## 6. Regarding project-level TERM debt...

	Debt / Total Capital	Fed Loan Guarantee / Debt	Average All-In Cost of Debt (%)
Average	<input type="text"/>	<input type="text"/>	<input type="text"/>
Low	<input type="text"/>	<input type="text"/>	<input type="text"/>
High	<input type="text"/>	<input type="text"/>	<input type="text"/>

Comments

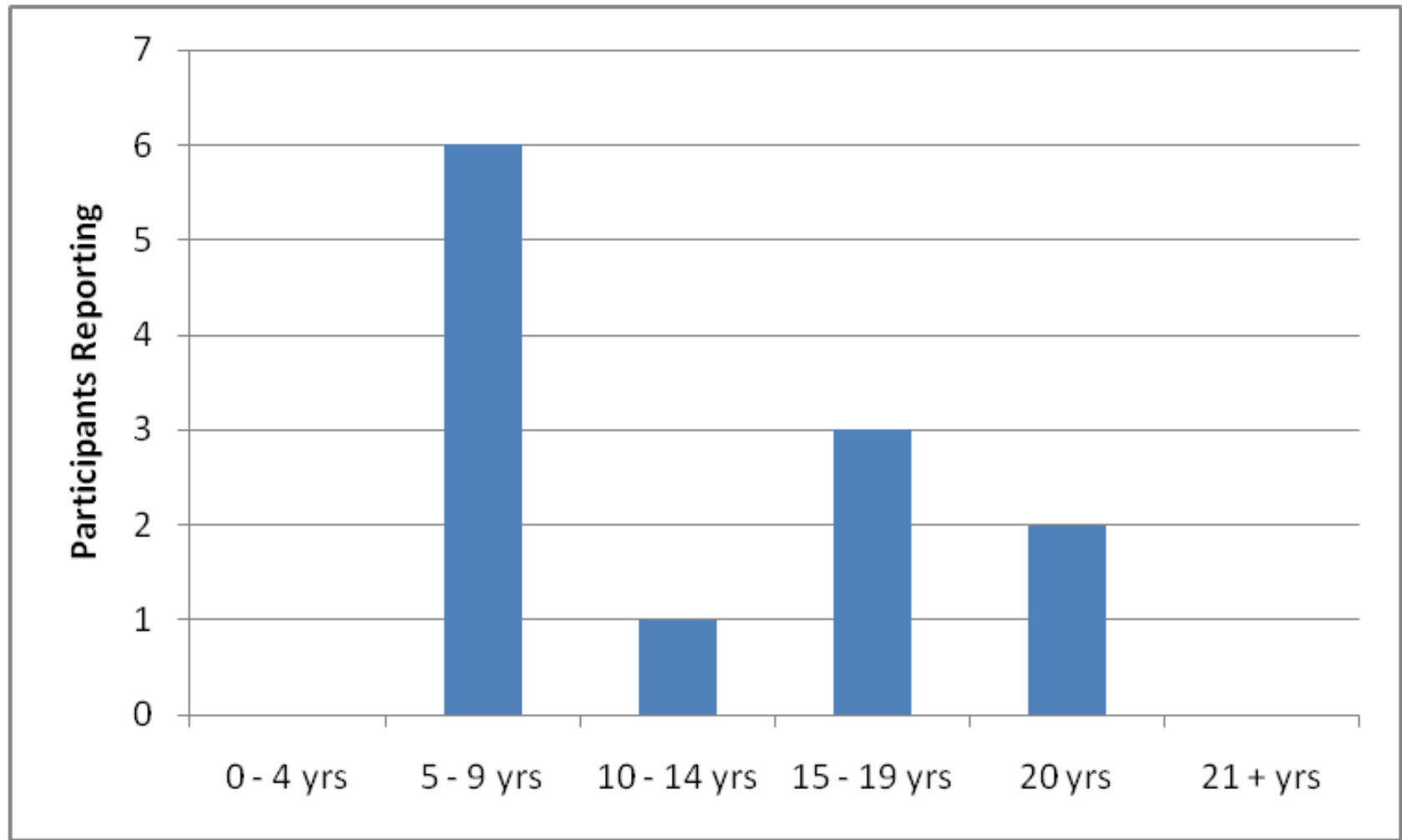
# Ratio: Debt to Total Capital



*Only 15 participants reporting*

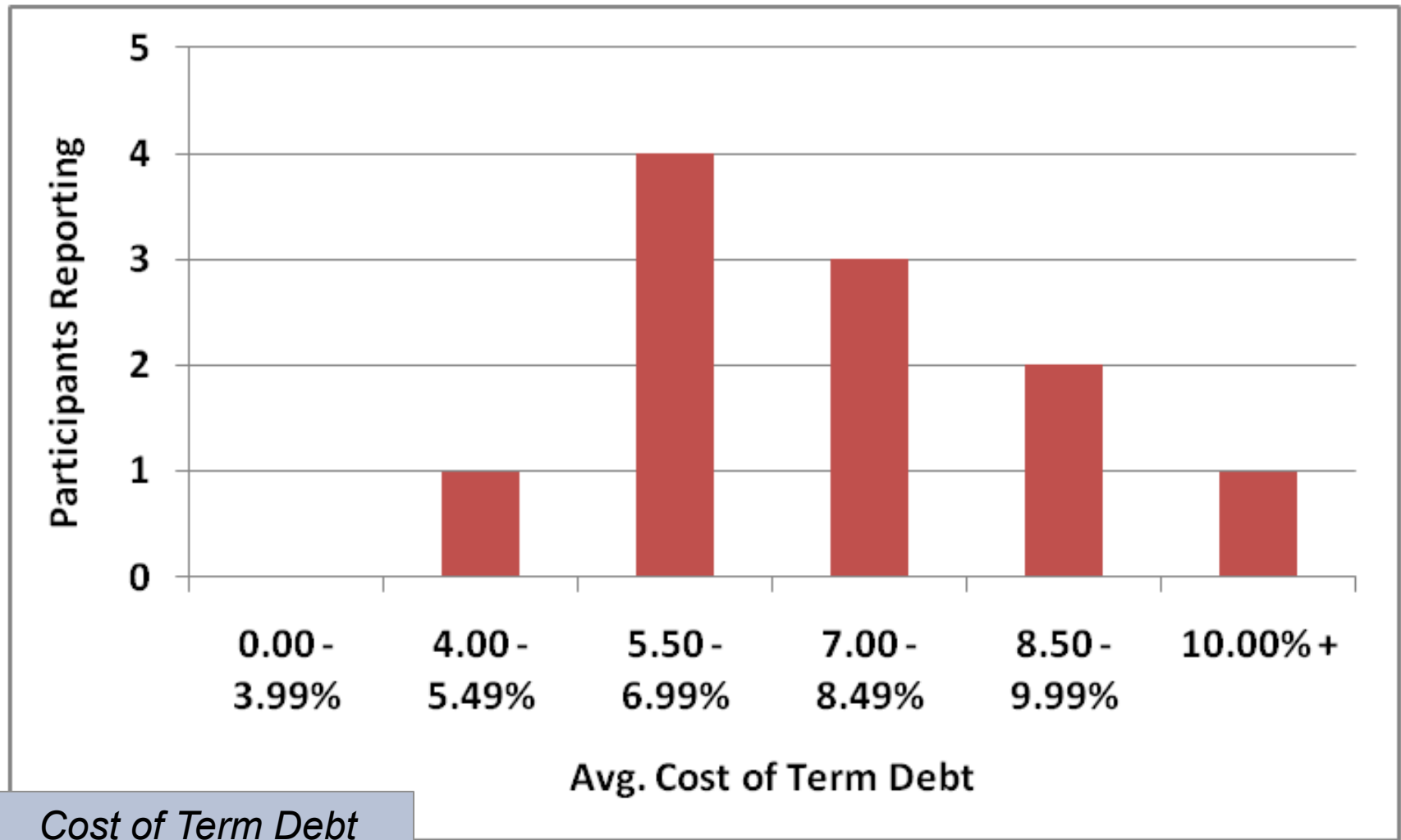


# Debt Term



*Short-term mini-perm most common debt term applied.  
12 participants reporting*

# Debt: Average Interest Rates



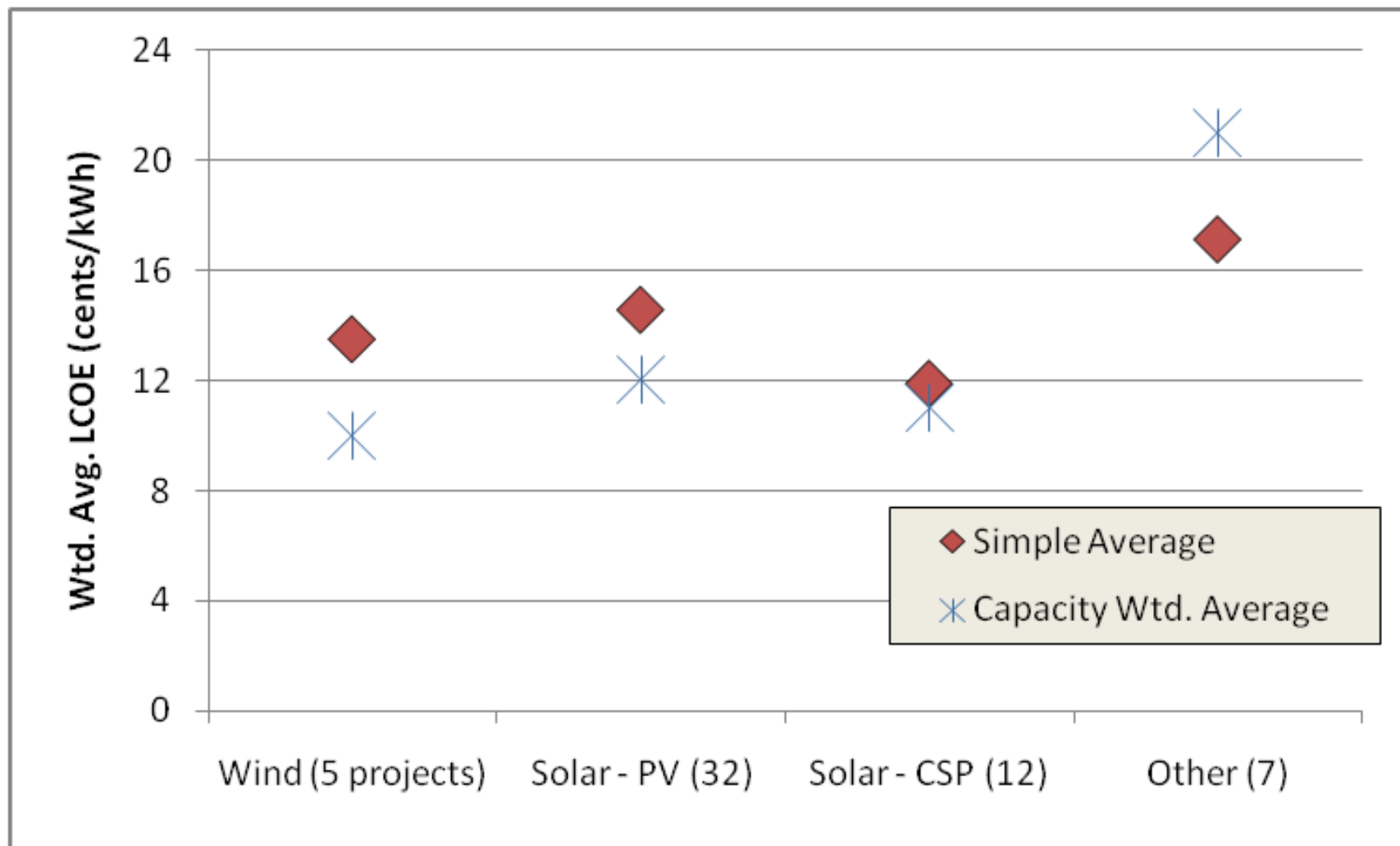
*Cost of Term Debt  
among 11 reporting  
participants*

# REFTI Question: LCOE by Technology

## 7. Provide the LEVELIZED COST OF ENERGY (LCOE) range from your projects...

	LCOE (cents / kWh)
Wind	<input type="text"/>
Solar - PV	<input type="text"/>
Solar - CSP	<input type="text"/>
Geothermal	<input type="text"/>
Biomass - Elec	<input type="text"/>
Biomass - Non-Elec	<input type="text"/>
Other (pls comment)	<input type="text"/>
Comments	
<input type="text"/>	

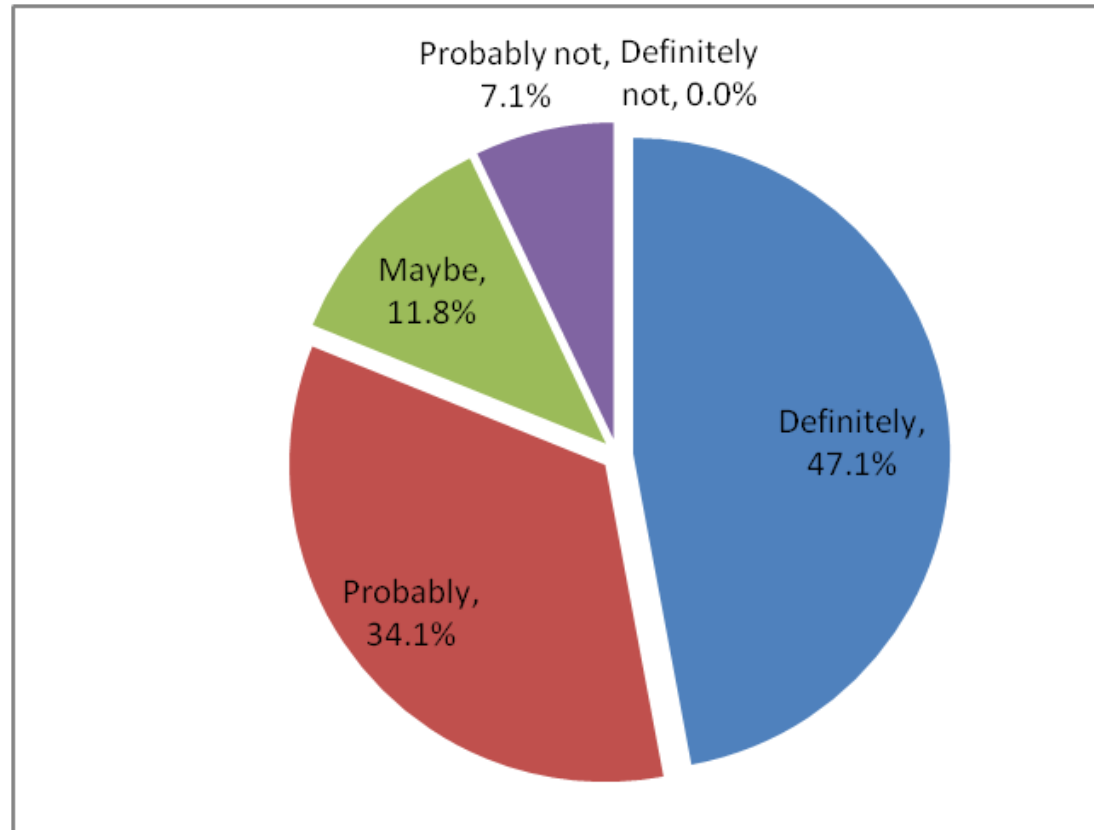
# Levelized Cost of Energy



*Higher than expected LCOEs reported for wind; lower than expected for PV / CSP. 43 participants reporting*

# Bonus Question: Value of REC Market Liquidity

**If markets for Renewable Energy Credits (RECs) were more liquid and transparent (i.e., similar to a stock market), would RE projects be able to better attract capital and close on financing?**



**81% of respondents probably or definitely believe improved REC market liquidity would assist in financing. 85 participants reporting**

# REFTI Participant Comments

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- “We didn't close any projects in Q3, primarily because of a difficult financing environment. We did close projects in Q4 however.”
- “Green Bank & Green Bonds Development Initiative! Financing Loans and the Credit markets are some of the major problems we are experiencing...”
- “The US is so far behind, even Eastern Europe, with respect to financing and PPA incentives.”

# Q4 2009 Questionnaire Improvements

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- Expand database
  - *Both invitees & respondents*
- Add solar thermal
  - *Hot water & space heating / cooling*
- Make more relevant to developers of multi-installations
- Provide for more detailed responses
- Assess finance barriers deeper
- Develop user manual
  
- Will be issued at end of the month!

# Data Confidentiality

- Ensuring REFTI participant data privacy is critically important to NREL
- Data gathered through REFTI will only be utilized for:
  - *Providing aggregate values for model inputs*
  - *Reporting trends*
  - *Participant-specific data will not be utilized or distributed in any way*
- Non-disclosure agreements are available
  - *Executing an NDA is fully voluntary*
- Please let us know if you have any concerns over data provided through this webinar
  - *Slides will not be made available immediately to allow time to raise concerns*
- Q3 Survey still available for review only



# Questions / Comments?

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# Thank you!

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Thanks to everyone for their  
participation!

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